

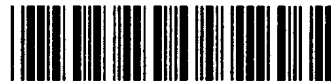
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**DEPARTMENT OF NATIONAL DEFENCE
CANADA**



OPERATIONAL RESEARCH DIVISION

DIRECTORATE OF OPERATIONAL RESEARCH (JOINT & LAND)

DOR(J&L) RESEARCH NOTE RN 2000/24

**ANALYSIS OF CANADIAN FORCES COMMITMENTS
SINCE WORLD WAR II**

BY

R.W. Funk

DECEMBER 2000

OTTAWA, CANADA



OPERATIONAL RESEARCH DIVISION

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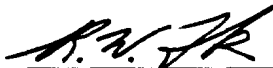
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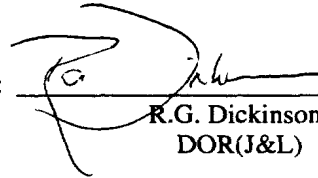
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OTTAWA, CANADA

DECEMBER 2000

ABSTRACT

This analysis set out to gain a better understanding about the quantifiable characteristics of CF commitments. The initial goal was to identify the main themes and then expand the effort along interesting lines of analysis when it appeared useful. The report explains how the available information on CF commitments was compiled into a comprehensive spreadsheet for subsequent analysis. The first component of the analysis focussed on visualising the data along timelines and in stacked figures. The key themes identified were then quantified using basic statistics in a series of tables. The results provide a useful set of activation rates needed by Scenario Operational Capability Risk Assessment Model (SOCRAM) and other strategic capability planning efforts.

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GLOSSARY

ALSC	Advanced Logistic Support Capability
CDS	Chief of Defence Staff
CF	Canadian Forces
CJTL	Canadian Joint Task List
DART	Disaster Action Response Team
DDA	Director Defence Analysis
DGSP	Director General Strategic Planning
DM	Deputy Minister
FPS	Force Planning Scenarios
FSX	Air Force Structure Exercise
MAJAID	Major Air Disaster
MCF	Multiple Contingency Force
PYs	Person-Years
SAR	Search and Rescue
SOCRAM	Scenario Operational Capability Risk Assessment Model
Sx	Scenario Number x
TSSU	Tactically Self-Sufficient Units
VCDS	Vice Chief of Defence Staff
Vx-y	Variation Number y in Scenario Number x
WWII	World War Two

ANALYSIS OF CANADIAN FORCES COMMITMENTS

SINCE WORLD WAR II

I - INTRODUCTION

BACKGROUND

1. The Force Planning Scenarios (FPS) described in [1-6] are only as good as the data used to generate their results. Of these, the single most sensitive parameter in evaluating capability is the rate at which the scenario variants occur. These commitments¹ involve activation² rates that start the simulation process and determine the source of the capability demands. Unfortunately, the evolving planning environment and lack of significant practical experience with many scenarios made it a difficult issue to resolve.

2. Part of the challenge is that any activation methodology must be both robust and flexible enough to handle any potential policy thrust and assist options analysis. To achieve this, it is necessary that the activation framework be able to accommodate a wide range of planning assumptions and interactions using only a few robust planning parameters. This simplified approach was necessary because the available policy guidance provides only basic information about the simultaneous activation of a scenarios and variants. Table I lists the scenario numbers, names and type; Annex A provides more detailed explanations of scenarios and variants.

¹ Commitment is a generic term used to cover any deployed activity including, but not necessarily limited to missions, operations, deployments, and actions.

² Activation refers to the start of a distinct commitment; it applies either where a commitment started as a fresh commitment or it was re-rolled and re-named from an existing commitment.

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TABLE I
LIST OF FORCE PLANNING SCENARIOS AND THEIR NUMBERS

Scenario Characteristics		
Scenario #	Name of Scenario	Domestic (D) or International (I)
0 ³	Arms Control	I
1	Search and Rescue (SAR)	D
2	Disaster Relief	D
3	Humanitarian Assistance	I
4	Surveillance and Control of Canadian Territory	D
5	Evacuation of Canadians Overseas	I
6	Peace Support Operations (Chapter 6)	I
7	Aid of Civil Power	D
8	National Sovereignty	D
9	Peace Support Operations (Chapter 7)	I
10	Defence of North America	D/I
11	Collective Defence	D/I

3. The framework must be able to sort through logical inconsistencies under any set of policy conditions. An activation framework that achieves these objectives has been built in the Scenario Operational Capability Risk Assessment Model (SOCRAM). To date SOCRAM development has used a set of representative activation values but a proper set of values are needed to conduct a useful analysis. SOCRAM and related capability planning studies need a set of real, quantitative data based on historical evidence. This data must be collated and analysed before the capability studies can proceed.

LITERATURE REVIEW

4. The search for experience with analysing activation rates of military operations started with a literature review. This produced only two relevant papers [7-8] that discussed conflicts after the Second World War. Both provided many worthwhile insights but neither had enough quantitative activation data to eliminate the need for a separate analysis.

³ Scenario 0 – Arms Control is not actually a scenario but is used here to account for a series of international obligations that fall outside the normal FPS.

- 3 -

5. Reference [7] provided a good summary of recent trends in major conflicts between 1988-1997. Its focus was on global effects and the major conclusion was that the post-Cold War period was one of volatility with intense pressure on Canada to contribute even more. A short section of that paper focused on Canadian contributions to United Nations Chapter VII resolutions but there was no mention of responses across the spectrum of conflict.

6. The second source was much closer to providing the sought after information. In 1996, reference [8] produced a global flashpoints analysis that summarised Canadian Forces commitments abroad from 1947 to 1993 and then attempted to relate these commitments to capability requirements. Reference [8] was noteworthy because it looked beyond major war-fighting conflicts to include low intensity efforts such as peacekeeping. This work also included the development of a spreadsheet that for the first time compiled a listing of CF commitments over time.

7. The J-Staff leveraged the reference [8] information into periodic reports that provided updated summary lists of current and past CF international operations [9A-9L]. These semi-annual reports provided the most consistent and authoritative set of operational activation data found to date. In the fall of 1999 the paper versions of these documents ceased in favour of a Web page [10]. Regrettably, the Web page's data are only updated for current operations, so the historical perspective and evidence are deteriorating with time. Current deployment strengths are updated as they change by the National Defence Command Centre [11] but there is no systematic collation of the data for historical retrospectives or subsequent analysis.

AIM AND SCOPE

8. This report explains how the available information on CF commitments was compiled into a comprehensive spreadsheet for subsequent analysis. The first component of the analysis focussed on visualising the data along timelines and in stacked figures. The key themes identified were then quantified using basic statistics in a series of tables. The results provide a useful set of activation rates needed by SOCRAM and other strategic capability planning efforts.

II - METHODOLOGY

RESEARCH QUESTIONS

9. The analysis set out to answer the following questions to gain a better understanding about the quantifiable characteristics of CF commitments. The initial goal was to identify the main themes and then expand the effort along interesting lines of analysis when it appeared useful. The initial research questions were:

- a. What are the key characteristics and rates of activation of CF commitments?
- b. Are there any distinct trends or breakpoints that stand out?
- c. What are the usual duration of commitments and to what extent do the missions overlap?

10. The initial analysis of these three questions provided a firm basis to determine the prime determinant for CF commitments and to mitigate the extent of uncertainty in the estimates of the variables. That said, the planning environment could easily diverge from prior experience, so the range of values selected for the variables must accommodate emerging or changing factors. The rationale behind the final set of selected values is articulated at the end of the analysis.

DATA COLLATION PROCESS

11. For sake of simplicity and conservation of effort the initial attempt involved trying to expand the original spreadsheet from [8] to incorporate later data. The most current version of [9] was obtained along with the active-missions matrix portions of all 13 available back issues (March 1994 to March 1999 [9A-9L]). The final sets of commitments added to the worksheet were active in November 1999 and were taken from [11].

12. The initial attempt to enter the data into the original worksheet did not succeed and it turned out to be the spreadsheet application itself. The problem was that the application had evolved over six years and reached the point where the latest version could not sort through a myriad of embedded linkages. In the end, the only practical option was to copy the relevant values into a new worksheet and restart the analysis.

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13. It also turned out that the information gathered on commitments had evolved significantly since reference [8], so a great deal of effort was required to collate a new set of coherent and consistent data. In the end, the historical perspective table from the March 1999 back issue of [9] served as the source for most past activities. The first step in the process was to enter the data into the current-missions matrix to produce a cumulative list of tombstone data for all relevant commitments. The start and stop dates for each commitment highlighted the periods when the entries were active. The back issues of the current-missions matrix and current commitments [9 and 11] were then used to populate the personnel strengths at the point in time where each set of data was collected.

14. The outcome of the effort was a fairly exhaustive list of all international operations tracked by CF Joint staffs. The active-missions tables from [9] provide personnel details on missions back to 1994 and this was extended to 1992-1993 using the flashpoints analysis data [8]. The commitments during 1990-1991 were then estimated using data from the commitment summary, start/stop times of the commitment and data from subsequent years. The overall effects of the 18 available snapshots of data was the creation of a coherent picture of personnel requirements during the decade from 1990 to 1999. Prior to 1990, the active-missions table estimates the annual data using the limited information from the historical summary table in [9L].

15. Several inconsistencies came to light during the data collation effort. One major cause involved operations tagged as having personnel over a multi-year period but missing values in intervening years (e.g. active 1990-1998 but no data for May 1995). In other cases, the start and stop dates were either vague or at odds with other data. There were also cases of irregular accounting of how personnel were employed in several concurrent operations⁴ within the same region. Lastly, some listed table totals did not agree with individual entries. Despite this, the compiled data set was assessed to be a fair and reasonable characterisation of the operating environment from 1947 to 1999.

16. The major limitation of the commitment matrix was that it only included international operations but no domestic operations. To overcome this shortcoming, a tentative list of domestic operations was compiled and added to the worksheet. The candidate domestic list included those mentioned in the force planning scenario

⁴ A separate historical review encountered the same issues and handled it by lumping together commitments when documented evidence and physical proximity indicated that personnel had flowed between commitments. The total numbers generated were very consistent.

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documentation [6] and from interviews with operators. The resulting list of 37 distinct domestic commitments is representative of the domestic operations since World War II (WWII).

WORKSHEET CHARACTERISTICS

17. Once the basic worksheet was in place it was a simple matter to add columns that differentiate different aspects of the operations for possible later analysis. The initial columns added allowed commitments to be classified by scenarios and regions. Columns were also added to differentiate operations by identifying:

- a. major CF formations or assets used;
- b. noteworthy commitments due to their size or nature; and
- c. sustainment issues.

18. A worksheet was compiled for the 105 international and 37 domestic commitments. Each CF commitment is entered as a separate row entry with columns covering four distinct areas as listed in Table II. Annex B provides a full listing of all data elements in the spreadsheet.

TABLE II
LISTING OF DATA AREAS IN WORKSHEET

Type of Data	Data Description
Tombstone	International & CF Operation Name
	Region & Location
	Mandate & Past Activity Number (If Operation is Complete)
Related Scenario and Duration	Assigned Scenario
	Variant (if comparable found)
	Start and Stop Dates
	Calculation of Duration
CF Commitment	Identified Sustainment Issue
	Listing of Formed Units Within Type of Activity
Personnel Allocations	Personnel Limits in Documentation
	Personnel Totals (While Op is Active)
	Personnel Totals from Documentation

III – VISUALISED RESULTS

ANALYSIS RESULTS

19. The analysis is based on the available data set for international and domestic operations up to November 1999 and the duration of each was calculated as of April 2000. The issues raised here only relate to the most obvious observations uncovered during the preliminary examination of the initial data set. The analysis was constructed to make it as automated as possible so it can be repeated quickly when a fuller set of data becomes available.

SOURCE AND LOCALE OF CF COMMITMENTS

20. The analysis of the data set started with a compilation of commitments along a timeline since the end of WWII. The timeline allowed a quick check to see if any glaring trends or breaks would come to light. The simplest metric to use was the personnel deployments in CF commitments. This information was extracted by taking the 1990s data and the previous summary data to estimate the annual personnel demand for each commitment between its start and end years. The demands were calculated using a pivot table and then Excel commands were used to assess the ratios. The resulting personnel totals are those deployed away from permanent infrastructure, including Canada's European Bases while they existed.

21. The figures that follow here are designed to help highlight the major data characteristics; they are deliberately kept in portrait orientation to avoid disrupting the flow of the text. Annex C contains full-page versions of the figures in landscape orientation along with additional figures used in analysis that are not described separately in text. Readers requiring precise values should refer to the worksheet used to generate the figures.

22. Figure 1 displays the timeline segmented to illustrate the nature of the commitments in terms of scenarios. The graph clearly indicates the magnitude of personnel involved in several of the major deployments; namely, the Korean War 1950-1953, Red River Flooding 1956, October crisis 1971, the Montreal Olympics 1976, Operation Salon 1990, the Persian Gulf 1991, Red River Flooding 1994, and the Ice Storm (1998). Despite these peaks, it can be seen that the majority of the scenario commitments remain intertwined together.

23. While the data set is not definitive, a major and abrupt shift in CF commitments can be detected. Prior to 1990 (other than the Korean War) the commitments involved relatively stable peacekeeping efforts with only a few major interjections from a few key domestic operations. During the 1990s the variety of scenarios increased and the activation periods (duration) were reduced. This shift in type of effort coincides with the end of the Cold War and Canada's closure of its European bases.

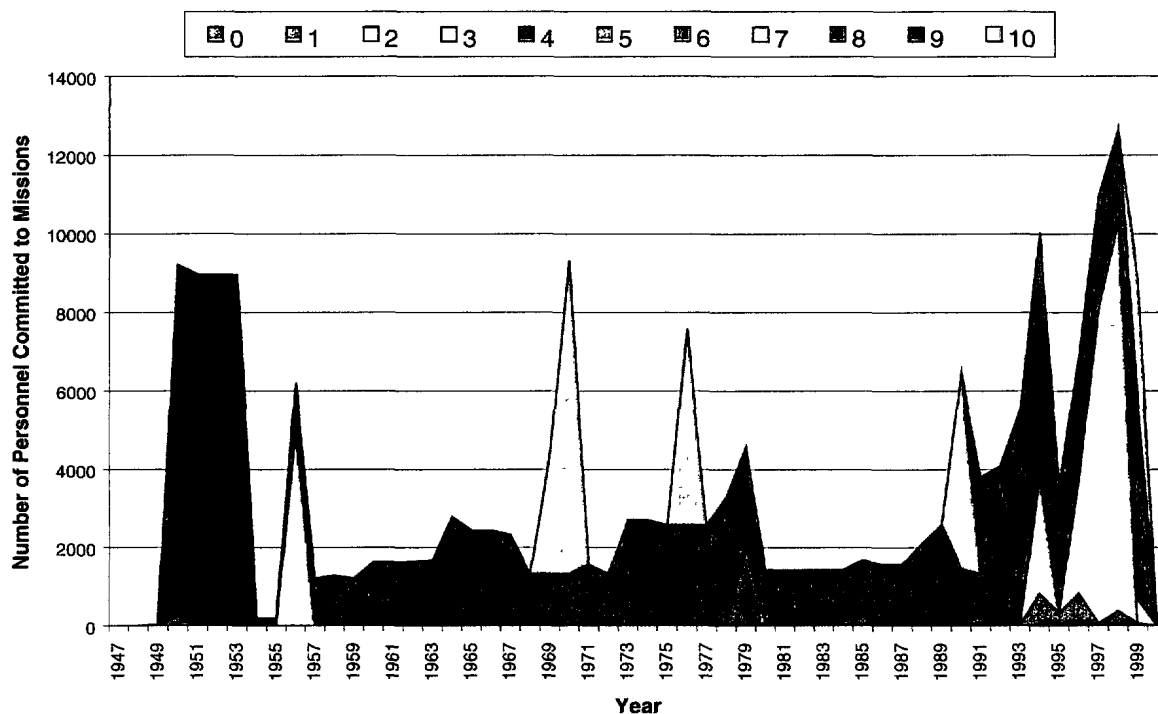


Figure 1: CF Personnel Commitments Since World War II by Scenarios

24. Figure 2 displays the timeline segmented by regions of operation. The objective was to see if any apparent shifts occurred in the areas where Canada conducts operations. The graph indicates that prior to 1990 the focus was on long term peacekeeping missions in the Middle East. These involved many years or decades coupled with interjections of short-term domestic operations over a few weeks or months. During the 1990s the size of the deployments in Canada and internationally increased while the international load shifted to the Balkans. The 1990s international commitments also encompassed a wider variety of regions than before and the periods of commitments were shorter; typically months or a few years.

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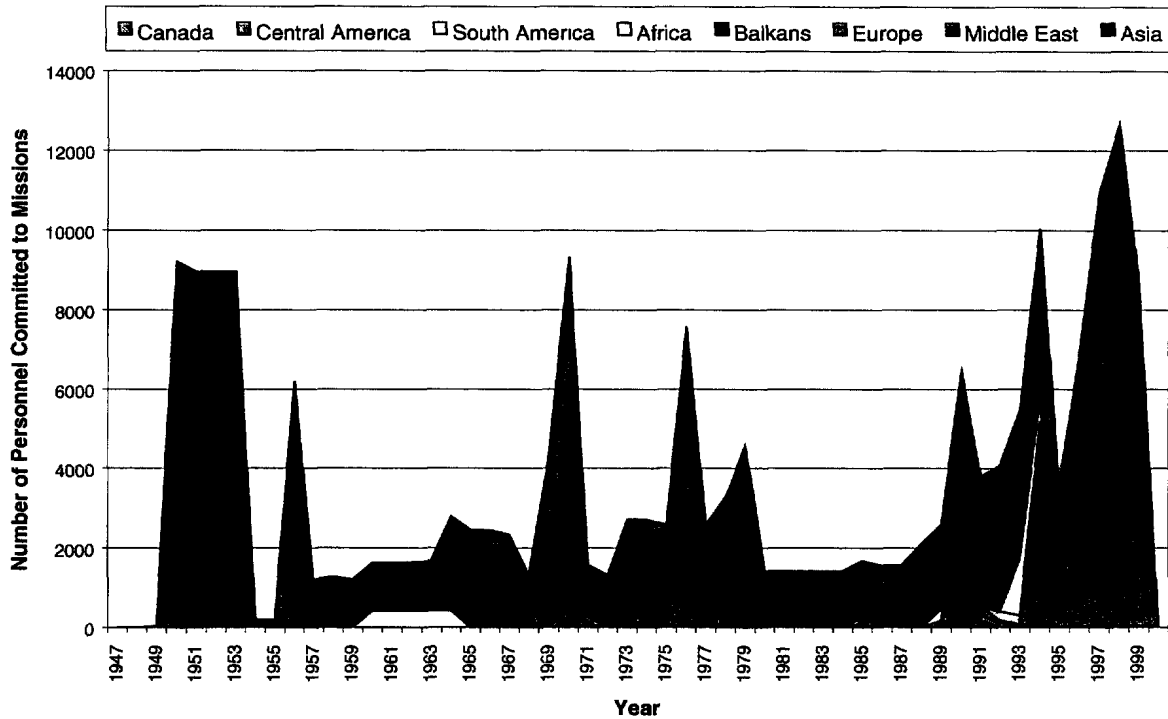


Figure 2: CF Personnel Commitments Since World War II by Regions

25. Figures 1 and 2 demonstrated in qualitative terms the abrupt shift in the rate of activity around 1990 and the volatility in both scenarios and regions of operations. The analysis then turned to identifying in more detail the nature of the differences before and after 1990. Figures 3 and 4 highlight how the numbers of scenarios and regions differed in these two periods.

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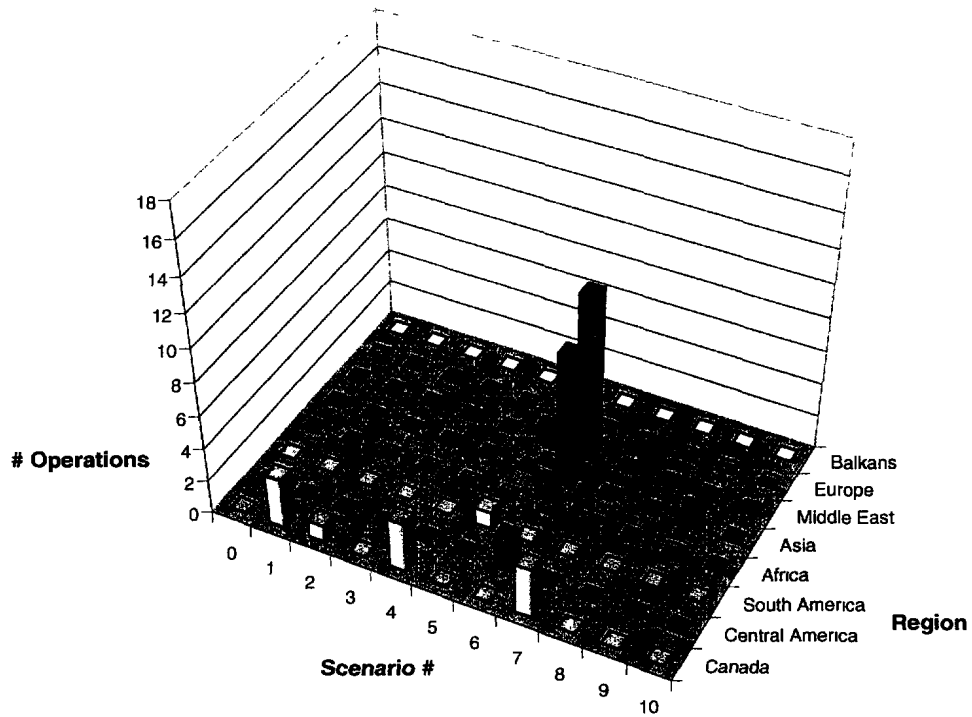


Figure 3: CF Commitment Before 1990 Distributed by Scenario and Region

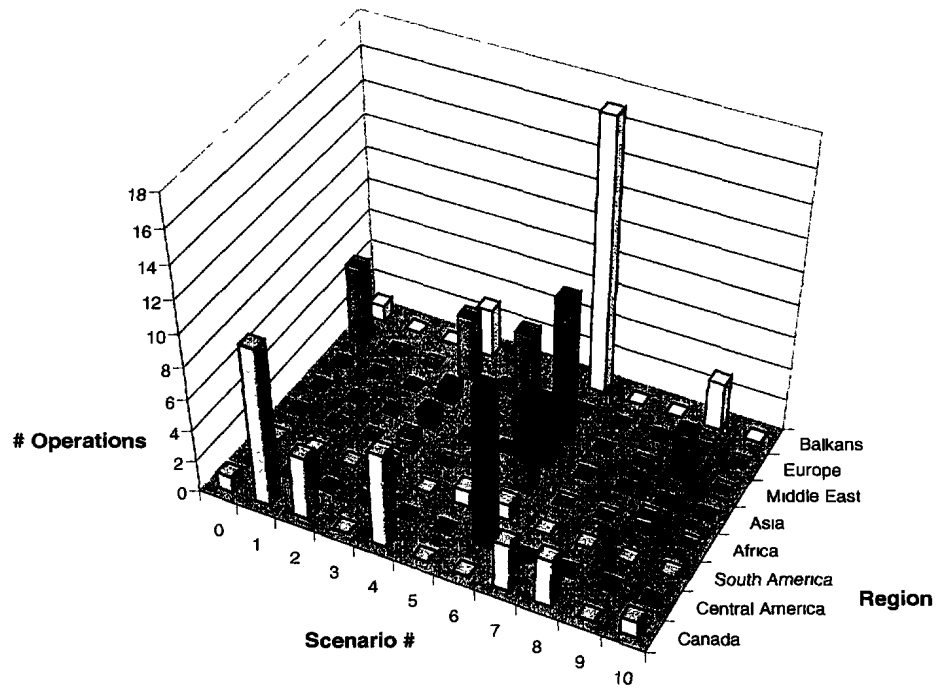


Figure 4: CF Commitment During 1990s Distributed by Scenario and Region

26. Figure 3 shows that during the Cold War the focus of effort was clearly centred on Scenario 6 operations and was dominated by commitments to the Middle East and Asia. Figure 4 indicates that during the 1990s the intensity and variety of CF commitments increased as Canada shifted from maintaining a static Cold War defence towards implementing new mandated obligations. The main international effort remained in Scenario 6 - Peace Support Operations but a major regional shift occurred towards the Balkans, Africa and Central America away from Asia and Middle East. There was also a large increase in effort towards Scenario 3 - Humanitarian Assistance and Scenario 9 - Peace Support Operations (Chapter 7). This represented a shift away from the CFs historical stance of protection, to one that emphasises more proactive and direct intervention. Concurrently, the 1990s saw a major increase in the variety and extent of domestic operations (Figure 5).

27. The previous two figures confirm predominance of commitments involving Scenario 6 - Peace Support Operations (Chapter 6) and domestic operations in Canada that are also evident in the Figure 3 timeline. They also highlight the abrupt shift in 1990 of the variety and location of commitments. With this in mind, Figure 5 was constructed to aggregate the key aspects of the data around these distinct themes. The figure illustrates the extent to which an increase in the number of personnel is related to the number of active commitments. The resulting abrupt shift in the number of deployed personnel occurred in tandem with a fundamental shift in both the number and types of missions. The Figure 6 focuses on the 1990s in order to highlight the volatility in the mix of activities.

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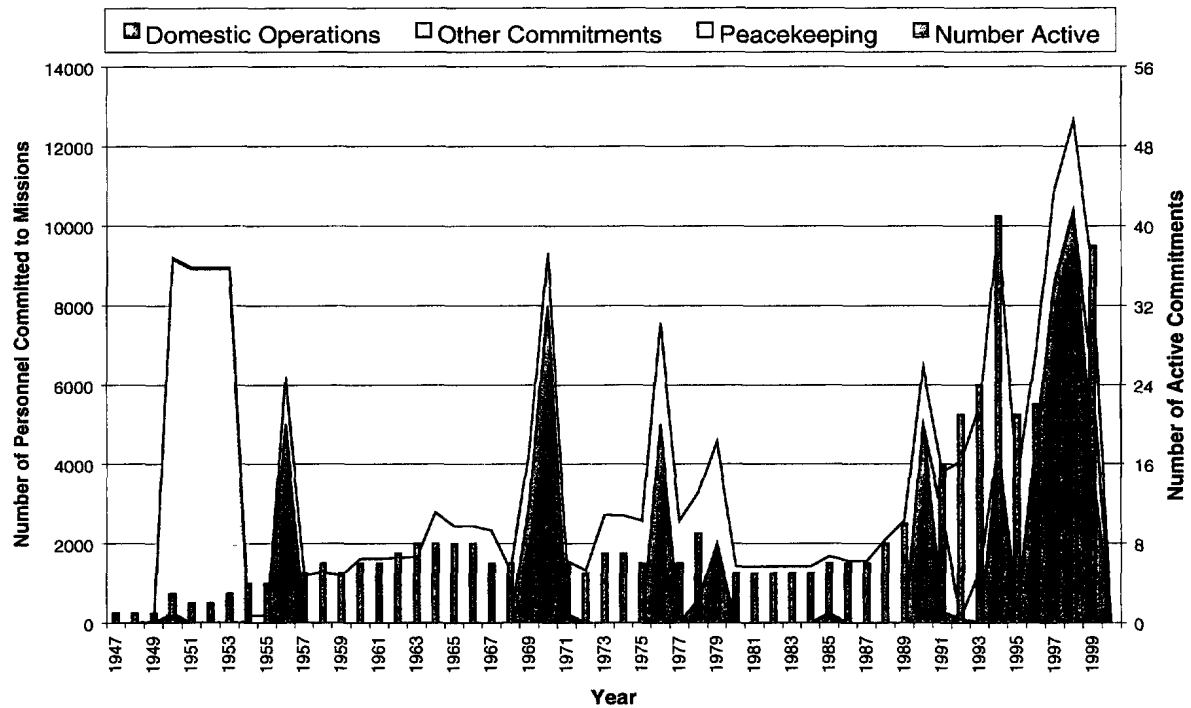


Figure 5: Aggregated CF Personnel Commitments Since World War II

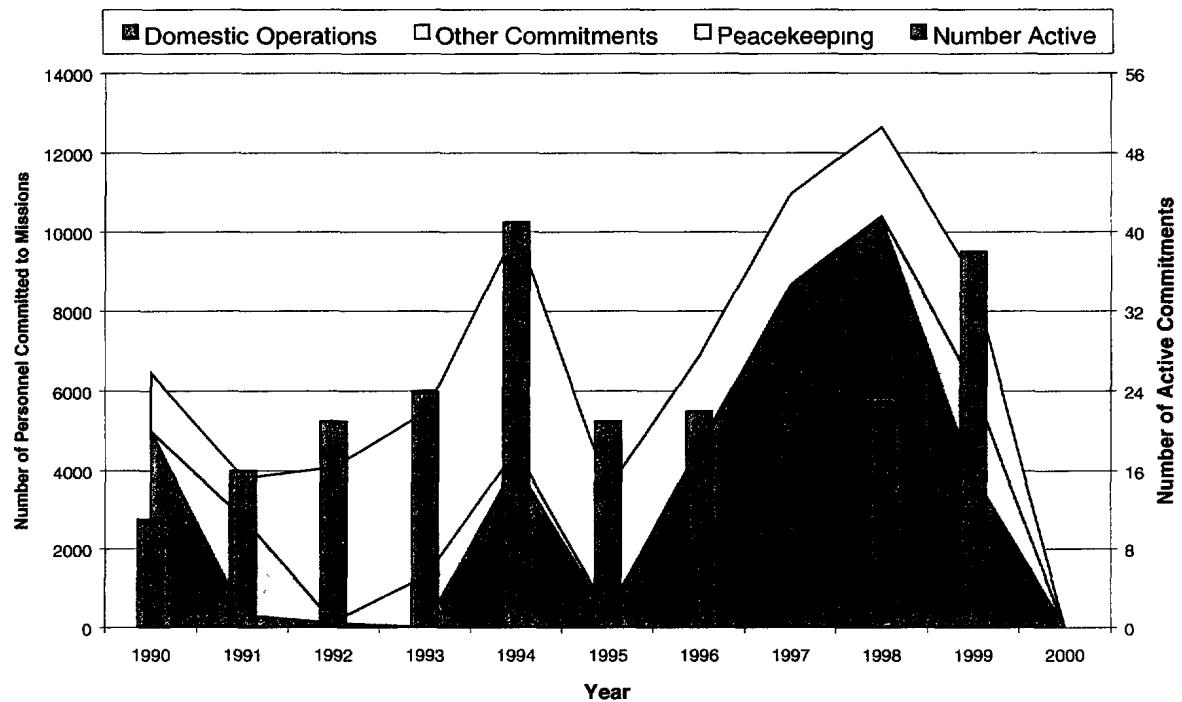


Figure 6: Aggregated CF Personnel Commitments During 1990s

CONCURRENCY OF CF COMMITMENTS

28. The initial characterisation of CF commitments in the previous figures provides key insights but does not address how the current potpourri of commitments arose. Tracking the coming and going of commitments based on their start and end dates poses the possibility that commitments accumulated, rather than resulted from policy. To help visualise the sources of the accumulated effort the data was split into three key building blocks of scenarios; namely Domestic, Scenario 6, and Other International commitments.

29. Figure 7 provides clear evidence that relatively few operations were initiated during the Cold War. For example, most of the 32 years between 1947 and 1979 involved only one or two new commitments per year followed by the 1980s with virtually no new deployments initiated during the Reagan Era arms build up in Europe. The end of the Cold War was accompanied by a huge jump in the annual number and variety of new commitments.

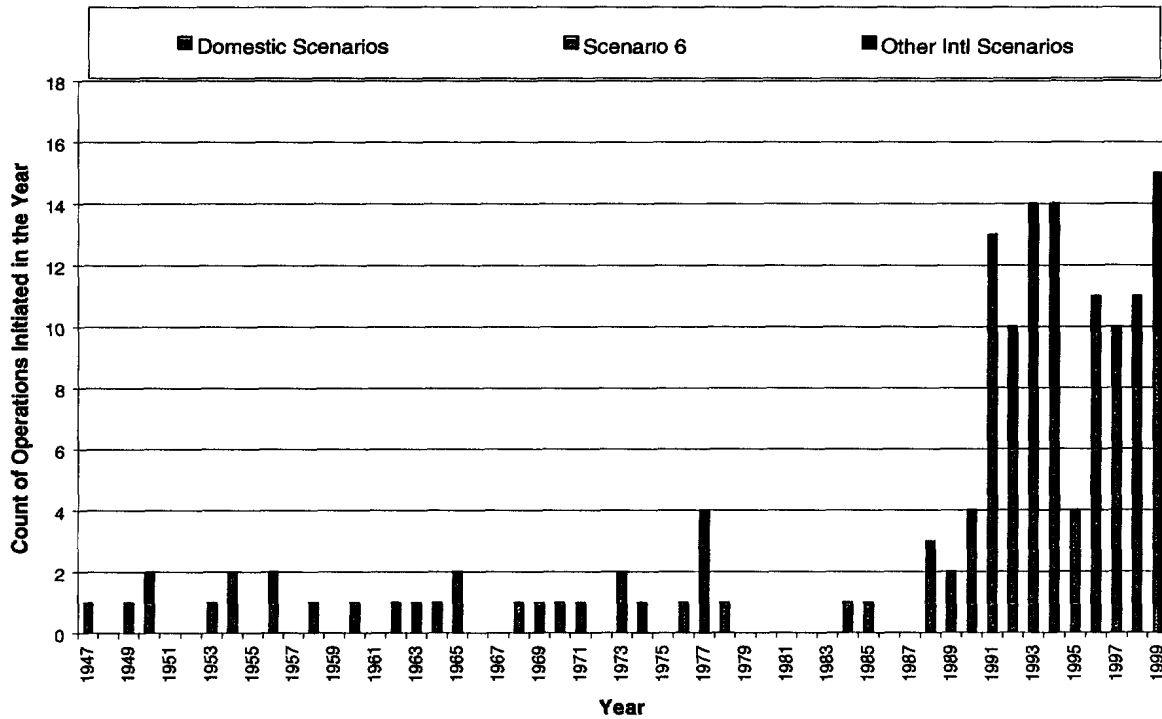


Figure 7: Count of CF Commitments Initiated Since World War II

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30. Figure 8 reorganises the timeline since World War II in terms of concluded commitments. The rate of termination from inception of the Cold War to the end of the 1970s suggests that there were periodic flurries that increased in frequency as the period progressed. This was followed by a hiatus in the 1980s when the objective appears to have been to maintain the status quo. During the 1990s the rate of terminations increased tremendously as the CF commitments switched rapidly from locale to locale.

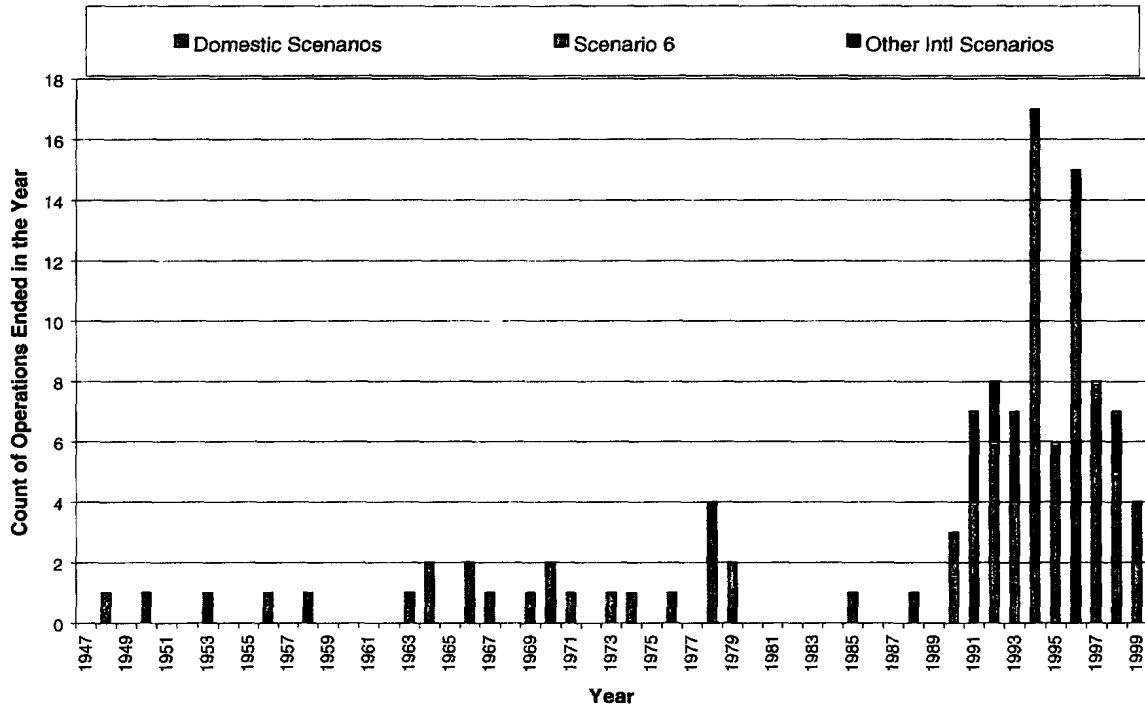


Figure 8: Count of CF Commitments Ended Since World War II

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31. The stacked bars in Figure 9 depict how commitments flowed in (+) at Figure 8 and out (-) at Figure 7. During the Cold War the change was gradual and easy to assimilate. The line shows how the 1950s was a period of slow accumulation in commitments that stabilised at 5-6 until the end of the Cold War. Then there is a sudden and rapid increase in the total number of concurrent commitments as Canada accepted a wider range of obligations and deployed in force into a variety of Balkan tasks.

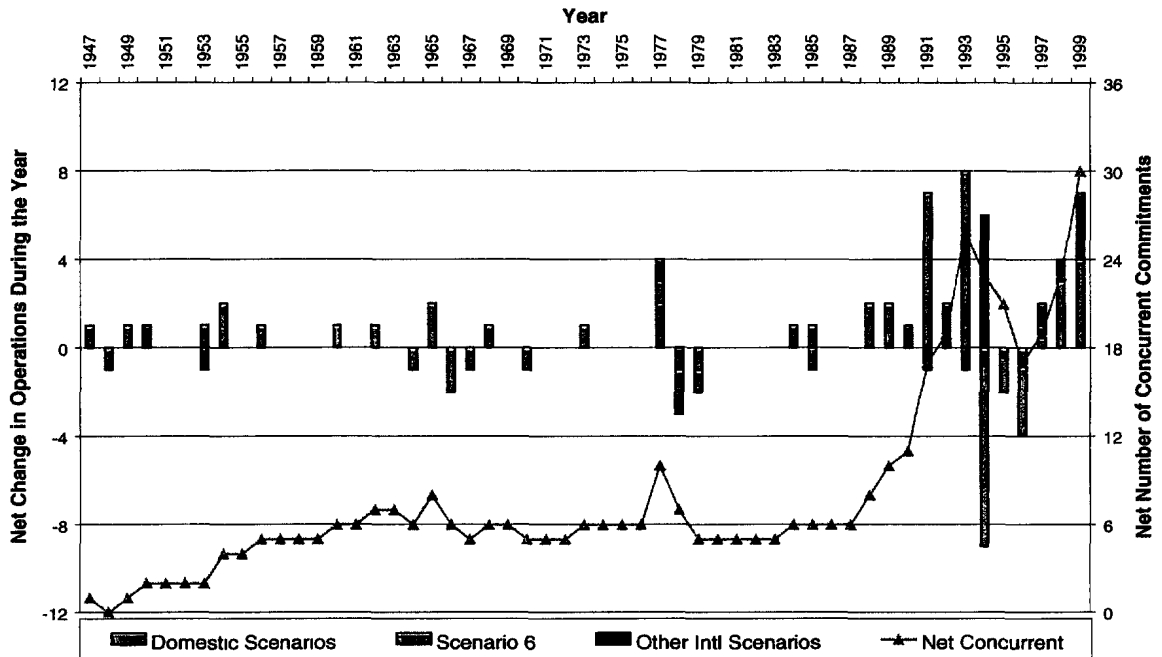


Figure 9: Net Change in CF Commitments Since World War II

32. The major expansion of effort in 1991-1993 was followed by a quick contraction in 1994-1996 that coincides with the post Somalia and Rwanda period when both the viability of traditional UN peacekeeping was challenged and the CF underwent a major downsizing in its resources. Just as quickly, the obligations accumulated again when the Balkans flared up during 1997-1999. The net effect of the 1990s was a five-fold increase in the number of commitments split into three distinct sub-periods.

33. The characteristics of the concurrent commitments need to be analysed further because concurrency is a key consideration in SOCRAM. Also, the increased volatility of accepting and terminating commitments during the 1990s imposed unique stresses on CF operations that need to be assessed in more detail.

DURATION OF CF COMMITMENTS

34. An entirely different perspective arises in Figure 10 when the same operation data is viewed from the perspective of average duration. The average duration of each year's commitments is tracked as a line and the cases where they rise to the theoretical maximum represents cases where the commitment is still active. The high spikes during the Cold War attest to the fact that the few commitments that occurred turned out to be long-term obligations. The figure also shows that the average duration of commitments initiated in the 1990s was more concentrated and complex than the Cold War period. Unfortunately, it is too crowded in the lower right corner of the graph to be seen in detail.

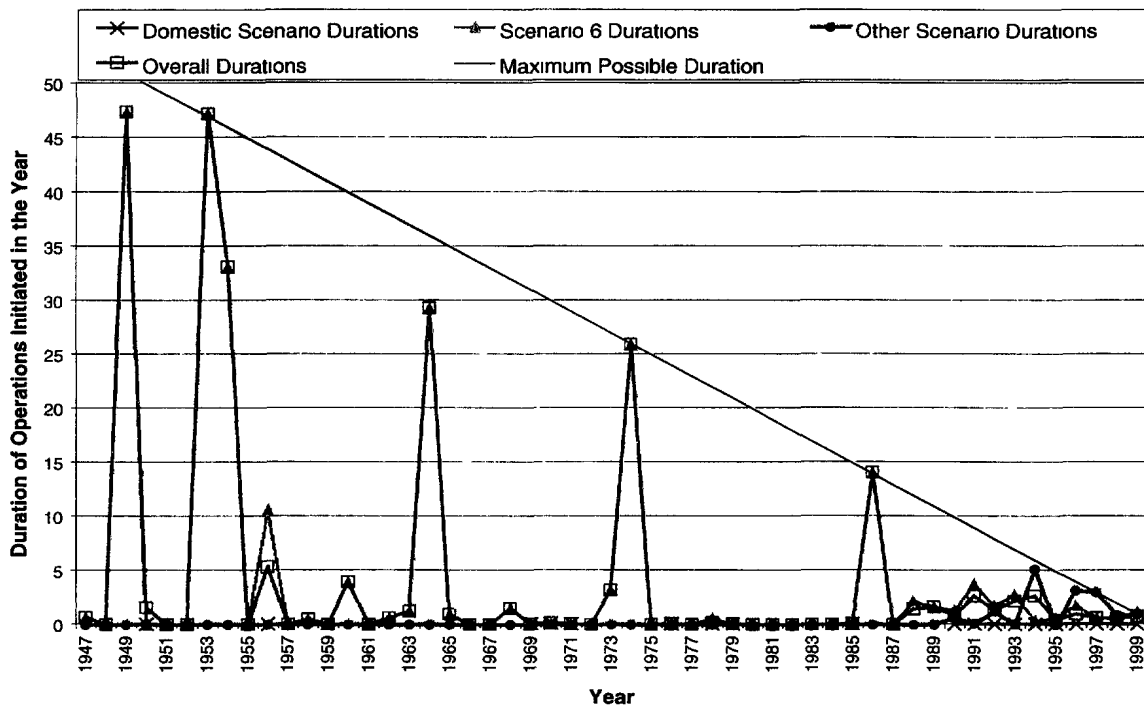


Figure 10: Duration of CF Commitments Initiated Since World War II

35. Figure 11 repeats the duration data focused on the 1990s. The wide fluctuations in yearly average duration show that very few yearly duration lines approach the maximum possible line. This confirms the perception that the CF tended to terminate commitments quicker in the 1990s than had been the historical pattern. Undertaking commitments of shorter duration offsets somewhat, but cannot eliminate, the problems of increased tempo.

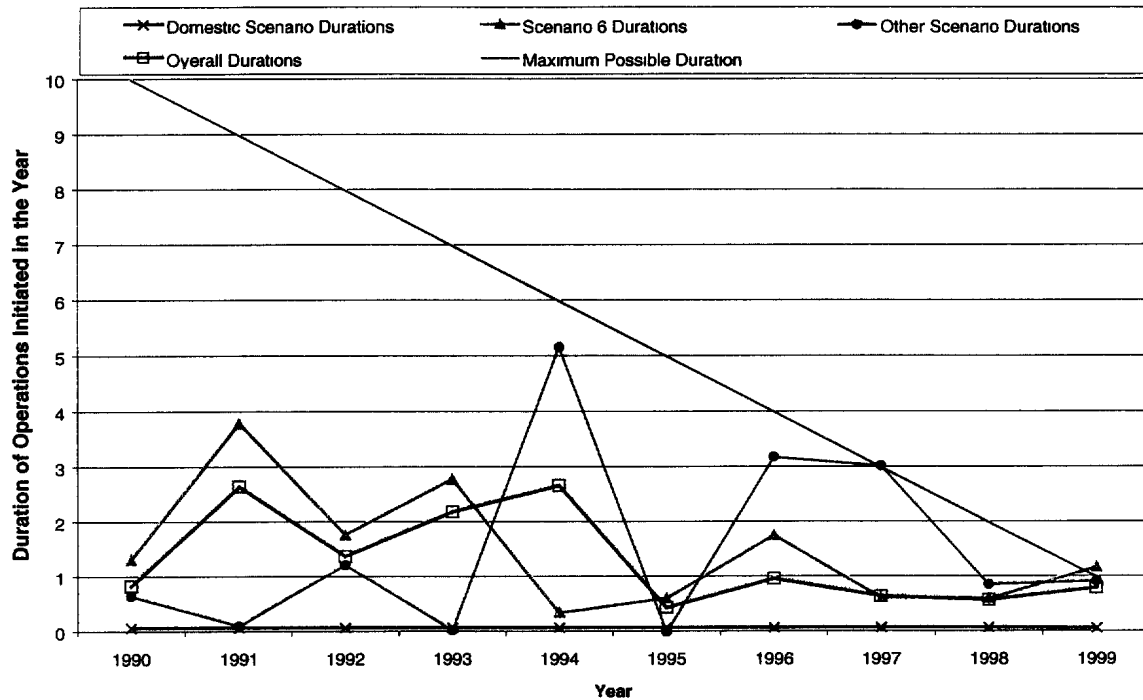


Figure 11: Duration of CF Commitments Initiated During 1990s

36. Figure 12 reorganises the duration analysis in terms of terminated commitments. The few terminations during the Cold War up to the 1980s do not provide much guidance other than to illustrate that some long duration cases were involved. The 1980s failed to terminate any long duration commitments. The 1990s appear to have made some headway in terminating long duration commitments but the records show that several of the longstanding commitments are being perpetuated to this day.

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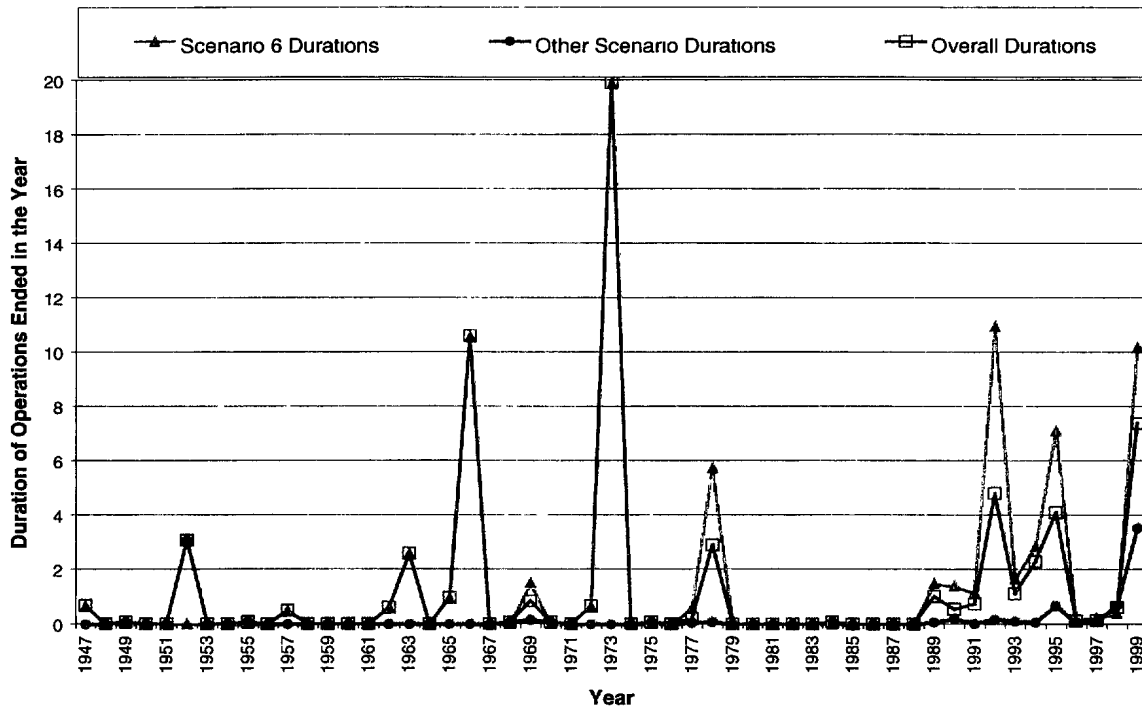


Figure 12: Duration of CF Commitments Ended Since World War II

37. The preceding visualisation analysis provides clear insights into the nature and complexity of the data set. The major outcome of this step is to recognise the following:

- a. The data confirms a “new world order” emerged at the end of the Cold War, so the Cold War and 1990s must be treated as distinct periods and analysed as separate entities;
- b. The mix of scenarios and regions changed significantly both in composition and rates between the two periods;
- c. The number of commitments accumulated slowly at the start of the Cold War and then remained stable until the 1990s when the total number became very volatile; and
- d. The long duration commitments of the Cold War changed to those of much shorter duration insertions during the 1990s; that said, several Cold War legacies still remain.

IV – QUANTIFIED RESULTS

DATA REDUCTION

38. The worksheet data used to produce the previous figures was available to do a corresponding statistical analysis. However, the insights gleaned from the visual review suggested that there is insufficient data to support sophisticated statistical analysis techniques. A decision was therefore made to limit the quantitative analysis of this report to totals, averages and annual rates within each of the two distinct periods (i.e. Cold War and 1990s). The use of cumulative totals encompassing both periods is avoided because aggregated totals would obscure the differences between the two periods. The analysis highlights the magnitude of these differences by calculating a “ratio” that is the rate of the 1990s usage over the rate for the Cold War period.

STARTS AND PERSONNEL TOTALS

39. The total number of commitments started and the associated number of personnel for each period have been captured in the following tables. Table III lists the statistics organised by scenarios and Table IV reorganises the list by regions. Two basic observations from the tables are that the full set of scenarios, with the exception of Scenario 11 - Collective Defence, have occurred and the coverage of the responses is global.

40. Table III shows that the Cold War period was limited to a sub-set of seven scenarios. The 1990s added significant levels of effort in Scenarios 3, 8, and 10 to cover the full range of scenarios (with the exception of Scenario 11 unless one chooses to re-classify the Korean War as such). A comparison between the two periods shows an increase in the number of starts across all scenarios for the 1990s. The number of personnel committed to lower numbered scenarios also increased in the 1990s. This effect was offset somewhat by a lower number of personnel being assigned to higher numbered scenarios. In layman’s terms, the annual rate of starts in the 1990s is almost 13 times that for the Cold War period.

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TABLE III
STARTS AND PERSONNEL SCENARIO TOTALS

Scenario Characteristics			Total # Starts			Total # Personnel		
Scenario #s	Name of Scenario	Domestic or Int'l	Cold War	1990s	Ratio	Cold War	1990s	Ratio
-	Overall Totals	D/I	36	106	12.7	38,634	49,075	5.5
-	Domestic Totals (Scenarios 1,2,4,7,8,10)	D	10	27	11.6	24,350	35,650	6.3
-	International Totals (Scenarios 3,5,6,9,11)	I	26	79	13.1	14,284	13,650	4.0
0	Arms Control	I	-	7	∞	-	62	∞
1	Search and Rescue (SAR)	D	3	10	14.3	2,500	2,350	4.0
2	Disaster Relief	D	1	4	17.2	5,000	24,000	20.6
3	Humanitarian Assistance	I	-	11	∞	-	897	∞
4	Surveillance and Control of Canadian Territory	D	3	6	8.6	850	1,700	8.6
5	Evacuation of Canadians Overseas	I	2	1	2.2	-	-	-
6	Peace Support Operations (Chapter 6)	I	23	53	9.9	5,361	8,572	6.9
7	Aid of Civil Power	D	3	3	4.3	16,000	5,100	1.4
8	National Sovereignty	D	-	3	∞	-	1,000	∞
9	Peace Support Operations (Chapter 7)	I	1	7	30.1	8,923	3,894	1.9
10	Defence of North America	D/I	-	1	∞	-	1,500	∞
11	Collective Defence	D/I	-	-	-	-	-	-

41. The details in Table III show, that overall, both international and domestic scenarios are affected in similar ways. The largest increases in number of international commitments occurred in Scenario 9, followed by Scenarios 3 and 6. Domestic totals were up sharply in Scenarios 1, 2, 4, and 8. These figures suggest a greater willingness by the government to employ the CF anywhere the government deemed to be appropriate. The drop in total personnel in Scenarios 7 and 9 is linked to lower levels of total resources as well as a more focussed use of them. The jump in Scenario 2 personnel is due to the CF being employed as the federal government's rapid reaction force in response to natural disasters. (Note however, that this list excludes the year 2000 deployment of CF assets to help clear away the snow in Toronto.)

42. The results of Table IV tend to reinforce the previous comments. The ratios highlight a major increase in most regions and major new thrust into Europe and particularly the Balkans. Asia and Middle East are relatively de-emphasised because their personnel totals are down significantly and the ratios for total number of starts shows only modest increases compared to the other regions. The major cause of the Cold War personnel levels in Asia is due to the Korea War.

43. A small word of caution is needed. Some of the increases in each ratio may have arisen from under-representation of the scenario commitments in the Cold War period. The data from this period is less specific than the 1990s period due to lack of detailed records. The scenario most likely to be under represented is Scenario 1 (SAR) because it happened so frequently and possibly Scenario 2 (Disaster Relief) since these records used to be maintained by individual regions in Canada. The effect is expected to be relatively minor because most scenario incidents tend to be newsworthy items that help to ensure they are remembered over time.

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TABLE IV
STARTS AND PERSONNEL REGIONAL TOTALS

Regional Characteristics		Total # Starts			Total # Personnel		
Region of the World		Cold War	1990s	Ratio	Cold War	1990s	Ratio
Overall Totals		36	106	12.7	38,634	49,075	5.5
Canada		10	28	12.0	24,350	35,651	6.3
International Totals		26	79	13.1	14,284	13,650	4.0
Central America		2	10	21.5	132	1,879	51.5
South America		1	3	12.9	-	541	∞
Africa		3	12	17.2	574	1,146	8.6
Asia		9	5	2.4	9,480	335	0.2
Middle East		11	13	5.1	4,099	3,885	4.1
Europe		-	9	∞	-	58	∞
Balkans		-	24	∞	-	5,578	∞
Not Specified		-	2	∞	-	1	∞

COMPARISON OF RATES BETWEEN PERIODS

44. Table V lists the annual rates of activation (i.e. average number of starts per year), average Person-Years (PYs) and duration of the missions for all the scenarios as listed in Annex A. Table VI revisits the same data set from the regional perspective. They repeat Tables III and IV using normalised data in a common metric of annual rates. The duration columns highlight the 1990s tendency to curtail Scenario 6 and 9 obligations more quickly than during the Cold War. Arms Control and Scenario 3 efforts tended to linger on due to long term government commitment to these politically positive obligations.

TABLE V
COMPARISON OF SCENARIO RATES BETWEEN PERIODS

Scenario Characteristics			Annual Starts		Average PYs		Avg Duration (Years)	
Scenario #s	Name of Scenario	Domestic or Int'l	Before 1990	During 1990s	Before 1990	During 1990s	Before 1990	During 1990s
-	Overall Totals	D/I	.84	10.6	898	4,907	7.5	1.5
-	Domestic Totals (Scenarios 1,2,4,7,8,10)	D	.23	2.8	566	3,565	0.1	0.2
-	International Totals (Scenarios 3,5,6,9,11)	I	.60	7.8	332	1,342	10.3	2.0
0	Arms Control	I	-	0.7	-		-	
1	Search and Rescue (SAR)	D	.07	1.0	58	235	0.1	0.1
2	Disaster Relief	D	.02	0.4	116	2,400	0.1	0.1
3	Humanitarian Assistance	I	-	1.1	-	90	-	1.4
4	Surveillance and Control of Canadian Territory	D	.07	0.6	20	170	0.1	0.1
5	Evacuation of Canadians Overseas	I	.05	0.1	0	0	0.0	0.0
6	Peace Support Operations (Chapter 6)	I	.53	5.3	125	857	11.6	1.9
7	Aid of Civil Power	D	.07	0.3	372	510	0.1	0.1
8	National Sovereignty	D	-	0.3	-	100	-	0.1
9	Peace Support Operations (Chapter 7)	I	.02	0.7	208	389	3.1	0.7
10	Defence of North America	D/I	-	0.1	-	150	-	0.0
11	Collective Defence	D/I	-	-	-	-	-	-

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TABLE VI
COMPARISON OF REGIONAL RATES BETWEEN PERIODS

Regional Characteristics	Annual Starts		Average PYs		Average Duration (Years)	
Region of the World	Before 1990	During 1990s	Before 1990	During 1990s	Before 1990	During 1990s
Overall Totals	.84	10.6	898	4,907	7.5	1.5
Canada	.23	2.8	566	3,565	0.1	0.2
International Totals	.60	7.8	332	1,342	10.3	2.0
Central America	.05	1.0	3	188	1.8	1.4
South America	.02	0.3	-	54	-	0.5
Africa	.07	1.2	13	115	2.2	1.4
Asia	.21	0.5	220	34	13.5	3.2
Middle East	.26	1.3	95	388	12.4	2.3
Europe	-	0.9	-	6	-	3.3
Balkans	-	2.4	-	558	-	1.8
Not Specified	-	0.2	-	-	-	1.4

ACTIVATION CHARACTERISTICS

45. SOCRAM calculations are based on scenario activation rates so the average annual starts is an ideal metric. SOCRAM takes account of the variability of the estimate by specifying a triangular distribution using a minimum, expected value and maximum. Each iteration's actual activation rate is selected from this distribution by a random draw.

46. The annual starts during the Cold War can be thought of as a reliable minimum activation rate because of the long body of experience. The 1990s data represents a reasonable expected value. The maximum value is harder to pin down since there is no guarantee of the extent to which the numbers of activities might reach. The decision taken was to specify the maximum value to be the expected value plus the minimum. This position assumes that the more variability demonstrated, the more it was susceptible to further perturbations. It also assumes the annual starts are independent of prior commitments and there is no pre-set maximum capacity. These conditions are not necessarily true but they help quantify realistic bounds on the problem.

47. Table VII provides the scenario activation and rotation information needed by SOCRAM. Table VIII repeats the exercise from the regional perspective. The activation rates are taken from Tables V and VI using the estimate process described above. The rotation values are found by dividing calculated duration into 6-month blocks, up to a maximum of 5 rotations (i.e. 2.5 years). The intent is to eventually calculate the rotation distribution using the calculated rotations for each commitment.

48. Equipment rotations are different from personnel rotations and are divided into two types. Equipment that remains in theatre for the next rotation of personnel is capped at two rotations. This is done so one set of equipment can act a reserve and be used to train personnel prior to deploying into theatre. Equipment that stays with a unit for use in other tasks is linked to the personnel rotations.

49. The rotations used in Table VII and VIII can also be modified to reflect expectations or policy considerations. Arms control is expected to continue in the future so all three estimates are set at 5 rotations. Scenario 3 experience suggests a need to allow for extensions of effort. Scenarios 6 and 9 involve larger units that were extended in theatre and thereby encountered sustainment issues. Scenario 10 and 11 are maximum effort commitments that are capped at a single rotation in the current policy guidance. All other scenarios are very short duration events where a single rotation should suffice.

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TABLE VII
SCENARIO ACTIVATION CHARACTERISTICS

Scenario Characteristics			Rate of Activation			Rotations		
Scenario #s	Name of Scenario	Domestic or Int'l	Min	EV	Max	Min	EV	Max
-	Overall Totals	D/I	0.8	10.6	11.4			
-	Domestic Totals (Scenarios 1,2,4,7,8,10)	D	0.2	2.7	2.9			
-	International Totals (Scenarios 3,5,6,9,11)	I	0.6	7.9	8.5			
0	Arms Control	I	-	0.7	0.7	5	5	5
1	Search and Rescue (SAR)	D	0.1	1.0	1.1	1	1	1
2	Disaster Relief	D	-	0.4	0.4	1	1	1
3	Humanitarian Assistance	I	-	1.1	1.1	1	2	3
4	Surveillance and Control of Canadian Territory	D	0.1	0.6	0.7	1	1	1
5	Evacuation of Canadians Overseas	I	-	0.1	0.1	1	1	1
6	Peace Support Operations (Chapter 6)	I	0.5	5.3	5.8	1	4	5
7	Aid of Civil Power	D	0.1	0.3	0.4	1	1	1
8	National Sovereignty	D	-	0.3	0.3	1	1	1
9	Peace Support Operations (Chapter 7)	I	-	0.7	0.7	1	2	5
10	Defence of North America	D/I	-	0.1	0.1	1	1	1
11	Collective Defence	D/I	-	-	0.1	1	1	1

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50. The regional rotation experience is less obvious than the scenario expectations. This is because each region involves several types of scenarios and as discussed above, each scenario has distinct characteristics. The values shown in Table VIII represent the observed past experience and should NOT be interpreted to imply any expectations about potential regional effects. They are only presented here to ensure the analysis record is as thorough as possible.

TABLE VIII
REGIONAL ACTIVATION CHARACTERISTICS

Regional Characteristics	Rate of Activation			Rotations		
Region of the World	Min	EV	Max	Min	EV	Max
Overall Totals	0.8	10.6	11.4	3	5	5
Canada	0.2	2.8	3.0	1	1	1
International Totals	0.6	7.9	8.5	3	5	5
Central America	-	1.0	1.0	1	4	5
South America	-	0.3	0.3	1	1	1
Africa	0.1	1.2	1.3	3	4	5
Asia	0.2	0.5	0.7	4	5	5
Middle East	0.3	1.3	1.6	5	5	5
Europe	-	0.9	0.9	1	5	5
Balkans	-	2.4	2.4	1	4	4
Not Specified	-	0.1	0.1	1	3	3

IV - DISCUSSION

DATA ISSUES

45. The current version of the spreadsheet contains a number of artefacts that need to be addressed before any further analysis is attempted. Table IX lists some key problems and the recommended correction:

TABLE IX
REGIONAL ACTIVATION CHARACTERISTICS

Issue	Recommendation
Many operations involve few personnel or intermittent activation but are listed before the major resource drivers simply due to their age.	Modify report to emphasise major drivers first, followed by consolidated list of legacy and minor tasks.
Segment scenarios into variants (particularly Scenario 6). Column exists to accommodate this new entry.	Calculate appropriate statistics.
Several listed operations would be better represented as a single conflict. e.g. Gulf War and Kosovo.	Add a column to table that consolidates individual operations under single conflict identifier and then aggregate them when assessing commitments.
Joint staffs to validate data in spreadsheet and then discuss their proposed changes with the analyst.	The staffs could make the entries directly into the worksheet. Discussions with analyst entering the data would provide insights on why commitments occurred or changed.

WAY AHEAD

46. The initial internal review of readily available data has produced a worthwhile compilation of commitments. However, this internal data set involved only a limited search for sources and used data that is known to contain inconsistencies. The issues at stake are too large to accept this type of uncertainty.

47. Rather than accept the status quo, it is recognised that the activation issue would benefit from a full and independent academic review of historical evidence using all available open sources. Towards these ends, a contract is underway and nearing completion for the period 1970-1999. Another contract is being prepared to cover the period 1945-1969.

48. Another major component of the SOCRAM data requirements is to calculate strategic lift implications. The activation data contains the information needed to determine the distances involved in past scenario deployments. The data from this report was used in [12] to calculate the distribution of minimum possible great circle distances associated with each scenario. Action is now underway to extend this analysis to take account of refuelling at way-point airports and no-fly zones, and to also repeat the analysis for ocean routes.

49. Once the expanded data set is available there is a requirement to re-analyse the activation rates and deployment distances. In the meantime, the available data is being put to good use beyond SOCRAM to help quantify other force planning assessments. Two examples of where the activation rates were used are:

- a. Air Force Structure Exercise (FSX) 2000 – June 2000; and
- b. Advanced Logistic Support Capability (ALSC) – September 2000.

V - CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

50. The major conclusions of the analysis of the CF commitments are that the:
- a. Available data is significant and useful;
 - b. Data can be segmented into force planning scenarios and regions. Further segmentation of scenario variants appears feasible and worthwhile;
 - c. Initial analysis provides clear and concise evidence that the nature of CF commitments has changed significantly between the Cold War period and the 1990s;
 - d. Results are a reasonable portrayal of past experience and answer the research questions. They were successfully compiled into a form suitable for SOCRAM and other force planning models; and
 - e. Results need to be validated by independent analysis.

RECOMMENDATIONS

51. The following recommendations are offered:
- a. Request that the VCDS formally sanction the use of the scenario data sets presented here as the baseline estimate for use by SOCRAM;
 - b. Complete the independent academic review for the full period since 1945 as soon as possible;
 - c. Integrate the academic review results with existing data to produce a comprehensive database of scenario experience;
 - d. Re-analyse the database to determine the revised activation statistics; and
 - e. Assess the observed concurrency characteristics to ensure SOCRAM portrays them realistically.

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8. P.F. O'Neill, *Flashpoints Analysis*, DLOR Research Note RN-9605, April 1996.

9. National Defence Headquarters/J3 Operations, Canadian Forces International Operations, 12 separate Editions (Dates of each data set are listed below).

<u>Sub-Ref</u>	<u>Year</u>	<u>Month</u>	<u>Day</u>
9A	1994	August	-
9B	1994	November	-
9C	1995	February	28
9D	1995	May	01
9E	1995	September	01
9F	1996	March	01
9G	1996	September	01
9H	1997	March	03
9I	1997	September	09
9J	1998	March	19
9K	1998	September	08
9L	1999	March	31

10. National Defence Command Centre (NDCC), Deployed Operations, Last updated November 1999, http://www.dnd.ca/dcdis/missions/msnmap_e.htm
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12. Ms D. MacLean, *Distribution Of Distances Travelled By The Canadian Forces During Strategic Lift Operations*, DOR(J&L) Research Note RN 2000/22, November 2000.

ANNEX A
DOR(J&L) RESEARCH NOTE RN 2000/24
DECEMBER 2000

DESCRIPTION OF SCENARIOS AND VARIANTS USED IN THIS ANALYSIS

NOTE: This annex describes the scenarios and the planning environment under which they are being developed. The bulk of the annex was copied directly from DPG 2001 [5] with the exception of the list of variants. They were created within SOCRAM to help quantify the circumstances under which demand accumulates within each scenario.

1. **Force Planning Scenarios.** A set of eleven force planning scenarios provides the context in which CF capability requirements and force structure options will be assessed. They span the spectrum of conflict (see Figure A-1) and describe operations representative of those anticipated by the CF. The scenarios will evolve as required to ensure they continue to reflect the strategic environment and Canada's defence perspectives. A brief description of each scenario is contained in Table A-I. More detailed descriptions of the scenarios are available from the OPI, Director General Strategic Planning/Director Defence Analysis (DGSP/DDA), or on the DDA Internet and Intranet sites. Requirements for capability, readiness, sustainability and deployability will be derived from the scenarios in conjunction with Defence Objectives and Tasks.

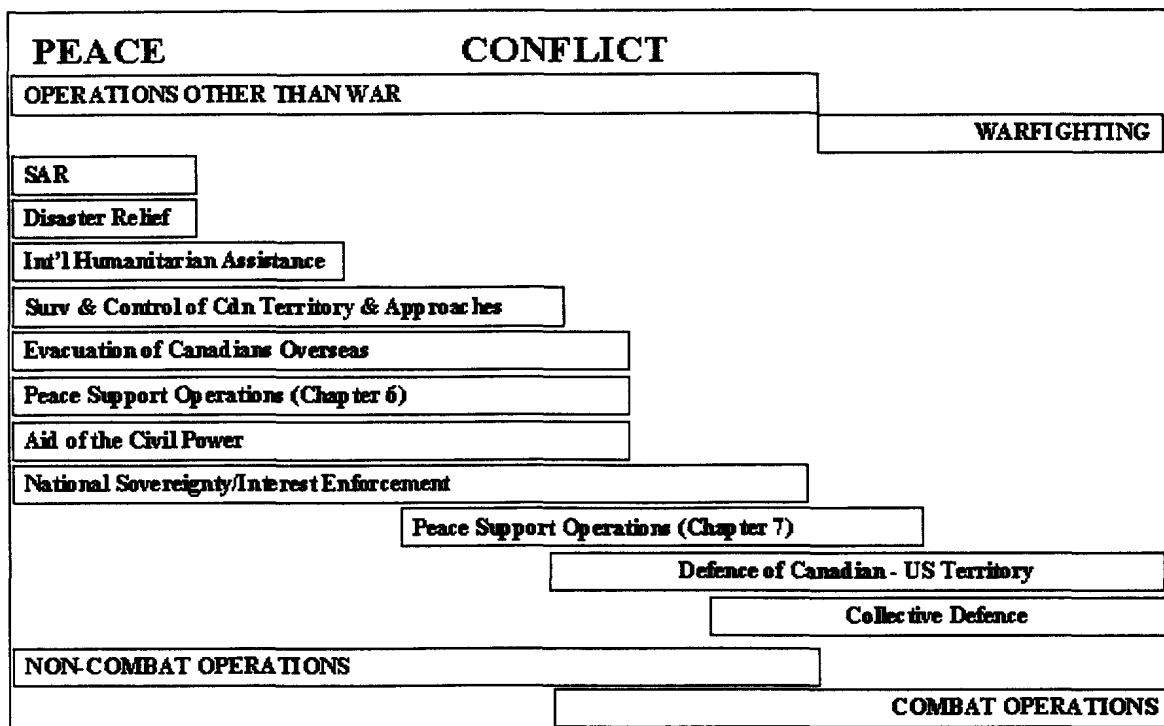


Figure A-1 - The Spectrum Of Conflict

TABLE A-I FORCE PLANNING SCENARIOS AND VARIANTS

Legend

Sx = Scenario Number x

Vx-y = Variant Number y in Scenario Number x

S1 Search and Rescue in Canada

Sub-scenarios include rescue from a ship at sea, search and rescue of an overdue hunting party in the North, and the rescue of survivors from a major airliner downed in a remote area in the North.

V1-1 – Lost Hunting Party - SAR Assets augmented by Rangers

V1-2 – Maritime Disaster - Maritime Assets (augmenting normal SAR)

V1-3 – MAJAIID response (augmenting normal SAR)

S2 Disaster Relief in Canada

Assist in the relief of human suffering and assist authorities to re-establish the local infrastructure after a major earthquake on the west coast of Canada.

V2-1 – Battle Group (enhanced)

V2-2 – Brigade (enhanced)

S3 International Humanitarian Assistance

As part of a UN operation, assist with the delivery of relief supplies to refugees amassed in a central African nation.

V3-1 – DART

V3-2 – Battle Group (enhanced)

V3-3 – Floating Support Ashore

S4 Surveillance \ Control of Canadian Territory and Approaches

Assist Other Government Departments and law enforcement agencies in identifying, tracking and, if required, intercepting platforms suspected of carrying contraband goods or illegal immigrants before or after entering Canadian territory.

V4-1 – Air Units

V4-2 – Maritime Units

V4-3 – Major air and maritime units with significant C2 support

S5 Protection and Evacuation of Canadians Overseas

Assist DFAIT, as part of a combined force, in the protection and evacuation of Canadian nationals in a foreign nation threatened by imminent conflict.

V5-1 – Permissive (minimal security requirements)

V5-2 – Air & Maritime Units as Part of Coalition Effort (Security Enhanced)

S6 Peace Support Operations (Chapter 6)

Participate as part of a UN peacekeeping force maintaining a cease-fire and assisting in the creation of a stable and secure environment where peace building can take place.

V6-1 – Battalion Group

V6-2 – Battle Group with C2 enhancement (Force HQ support)

V6-3 – Blockade of Coastline in Littoral Waters

S7 Aid of the Civil Power

Assist civil authorities in the establishment of law and order in an area where lawlessness has occurred as the result of disputes over the control of water rights in a time of severe drought.

V7-1 – Battle Group (enhanced)

V7-2 – Brigade (enhanced)

S8 National Sovereignty/ Interests Enforcement

Claiming extended jurisdiction under UNCLOS III, Canada has requested the cessation of seabed exploitation operations by a foreign nation. The CF will assist OGDs in the enforcement of Canadian claims.

V8-1 – Surveillance Assets

V8-2 – Escalation to Violence

S9 Peace Support Operations (Chapter 7)

At the request of a foreign nation, as part of a UN coalition, the CF will participate in operations to restore pre-conflict boundaries and return control of an occupied area to the control of the rightful country.

V9-1 – Battle Group (enhanced)

V9-2 – Vanguard Brigade

V9-3 – Vanguard Air Squadron

V9-4 – Vanguard Naval Task Group

S10 Defence of Canada/US Territory

In co-operation with US forces, the CF will defend Canada/US territory against potential threats initiated by an emerging world power as a result of Canadian and American support for a foreign military operation.

V10-1 - Brigade (enhanced)

V10-2 – Full Multiple Contingency Force (MCF)

S11 Collective Defence

As part of a NATO force, the CF will attempt to deter and, if necessary, contain an attack on NATO territory and conduct restoration operations.

V11-1 – Vanguard Brigade

V11-2 – Vanguard Air Squadron

V11-3 – Vanguard Naval Task Group

V11-4 – Full Multiple Contingency Force (MCF)

VANGUARD AND MAIN CONTINGENCY FORCE CHARACTERISTICS

2. While the 1994 White Paper provided broad guidance on the capabilities and personnel strengths of vanguard and main contingency forces (MCF), the MOS Review II and strategic lift considerations highlighted the need for more precise force structure guidance. While the numbers developed are slightly higher than anticipated in 1994, they do not undermine the CF's ability to deliver defence policy. For Level One force planning purposes, the maximum size and composition of the vanguard and MCF, in terms of personnel, reserve and lane meters, shall be as follows:

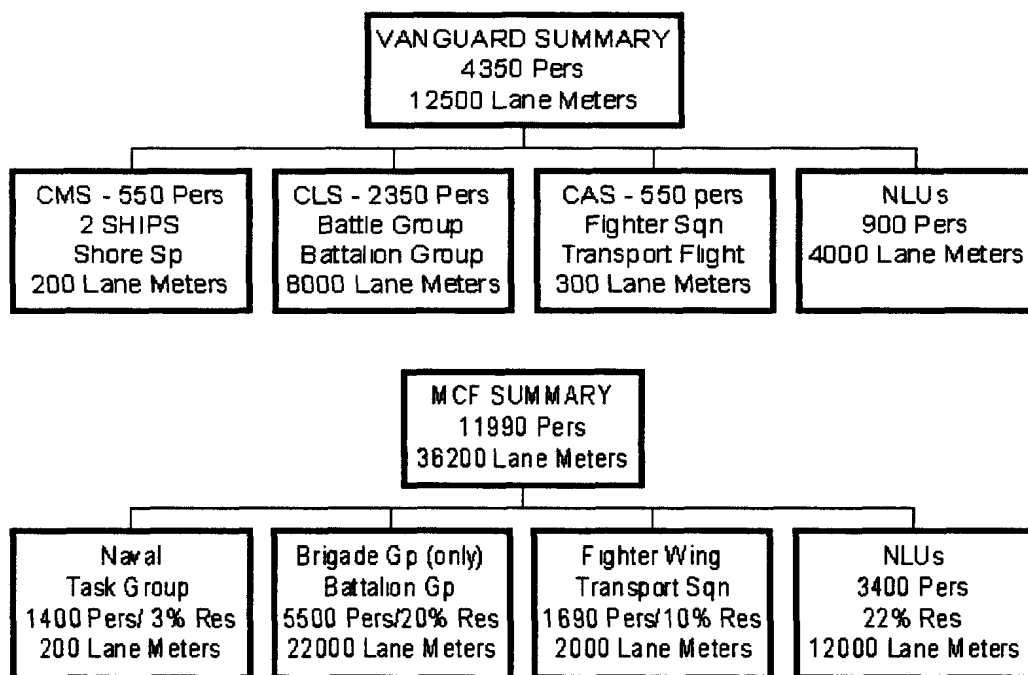


Figure A-2 - CF Vanguard and MCF Summary

3. Figure A-2 summarises the Vanguard and MCF composition, number of personnel and lane meter restrictions for planning deployments and operations. These forces will include up to twenty percent Reserve Force personnel. Due to readiness issues, it is recognised that the initial two Vanguard rotations will be primarily Regular Force. However, it is expected that subsequent rotations will employ more Reserve forces, so that the overall twenty- percent Reserve Force employment is realised. Defence planners are to make full use of this guidance and the force planning scenarios when developing force structure and capital equipment options.

4. **Unit Rotation Ratios.** As a general planning principle, the rotation ratio for deployed forces is 3:1. This results in a force structure that is four times the size of the potentially deployed force. During a period of high operational tempo this would result in units undertaking six-month tours and then returning to Canada for eighteen months before being re-deployed. In the case of the Land Forces and National Level units, both of which have historically been deployed for many years, it is accepted that the rotation ratio will be 4:1. For these units only, the force structure would require five times the number of units (including Reserves) potentially deployed and would yield a twenty-four month pause between successive operations. Short of mobilization Stage Three or Four, the MCF will be deployed to theatre but will not be sustained. Separate CDS guidance has been issued to ensure a minimum of 12 months in Canada between rotations for individual CF members.

5. **CF Concept of Operations.** The CF must retain the ability to assess the need for, plan the deployment of, sustain and command (as appropriate) deployed forces, at home and abroad. This entails adequate means to command and exploit information and intelligence at the military strategic level. At the operational level, capability requirements are more selective. Therefore, the fundamental assets that the CF requires for international operations (and also as key contributors to fulfilling domestic responsibilities) are tactically self-sufficient units (TSSUs). Current examples of TSSUs in the NATO context are the various elements of the Vanguard force. TSSUs such as the Immediate Reaction Force (IRF) Battalion must be capable of integrating into a Combined Force package as a "task-tailored" component. The consequence of the requirement to integrate into a Combined Force is that TSSUs must be modular and adaptable, capable of integrating with other international and national forces that are likely to be involved in a joint and/or combined operation. Level One Managers are directed to develop their force proposals in accordance with this concept of operations.

6. **Canadian Joint Task List.** To ensure a common lexicon for the discussion of Canadian Forces capabilities, a Canadian Joint Task List (CJTL) has been developed and linked to similar allied Joint Task Lists. The CJTL establishes an outline for describing and relating the types of capabilities that may be required, to greater or lesser degrees, by the CF. The CJTL provides a common language for those involved in DND/CF force development. Table A-II provides Level One Managers with an indication of the relative amount of capability that the CF seeks to achieve within CJTL. The boxes marked with 'H' are those where the CF seeks to have a high degree of capability. Those with 'M' indicate a medium or moderate level of capability. An 'L' indicates that the CF seeks only a lesser degree of capability in that area. This framework was endorsed by a Special Senior Management Oversight Committee chaired by the DM and CDS in March 2000.

TABLE A-II
CANADIAN JOINT TASK LIST MATRIX

Level	Capability Areas						
	Command	Info & Intel	Ops			Sustain	Generate
			Conduct Ops	Mobility	Protect		
Military Strategic							
Operational							
Tactical							

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ANNEX B
DOR(J&L) RESEARCH NOTE RN 2000/24
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DESCRIPTION OF DATA ELEMENTS USED IN THE WORKSHEET

1. The worksheet that was compiled as a result of this analysis is based on listing each CF commitment as a separate row entry with corresponding columns within four major information groupings. The grouping and associated data columns are as follows:

- a. Tombstone Data
 - Common Name
 - CF Operation Name(s)
 - Region
 - Location
 - Past Activity Numbers (for tracking purposes)
 - Mandate
 - UNSCR #(s)
 - Source of CF Commitment
- b. Related Scenario and Duration
 - Scenario(s)
 - Variant(s)
 - Calculation of Duration
 - Start Year – Month - Day
 - End Year – Month - Day
 - Duration (Days)
 - Duration (Years)
- c. Commitment Characteristics
 - Sustainment Issues (?)
 - Types of Response in Terms of Formed Units
 - Army
 - Navy
 - Air Force
 - Support
 - Observers
 - HQ Personnel

- d. Personnel Allocations (made up of four major sub-groups);
- i. Overall Personnel Characteristics,
 Contingent Size - Total from all Countries (as per documents)
 Canadian Maximum Allowed (as per documents)
 Canadian Actual Maximum At Any Time (as per documents)
 Calculated Canadian Maximum Involved
 Calculated Canadian Average Involved

- ii. Personnel Totals from Documents
 (18 snapshots : Mid 90 – Nov99),
 1990-91 Estimated (Est)
 1992-93 Phil O'Neill (Phil)
 1994-99 Documents (Doc)

<u>Year</u>	<u>Source</u>
Mid 90	Est
Mid 91	Est
Mid 92	Phil
Mid 93	Phil
Mar 94	Doc
Aug 94	Doc
Nov 94	Doc
28 Feb 95	Doc
1 May 95	Doc
1 Sep 95	Doc
1 Mar 96	Doc
1 Sep 96	Doc
3 Mar 97	Doc
9 Sep 97	Doc
19 Mar 98	Doc
8 Sep 98	Doc
31 Mar 99	Doc
Nov 99	NDCC

- iii. 1990s Decade Personnel Totals (Only while Op is active),
Count of Times Listed

Person-Year Totals in Decade

Minimum

Average

Maximum

Annual Totals (10 years : 1990-1999)

<u>Year</u>	<u>Source</u>	
1990-91	Estimated	(Est)
1992-93	Phil O'Neill	(Phil)
1994-99	Documents	(Doc)

- iv. Personnel Totals Used in Figures and Tables.

Total Person-Years (PYs)

Average PYs

Annual PY Totals (54 years : 1947-2000)

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ANNEX C
DOR(J&L) RESEARCH NOTE RN 2000/24
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FIGURES USED TO VISUALIZE EXTENT OF CF COMMITMENTS

LIST OF FIGURES

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Figure C-2: CF Personnel Commitments Since World War II by Region C-3

Figure C-3: CF Commitment before 1990 Distributed by Scenario and Region C-4

Figure C-4: CF Commitment during 1990s Distributed by Scenario and Region C-5

Figure C-5: Aggregated CF Personnel Commitments Since World War II C-6

Figure C-6: Aggregated CF Personnel Commitments During 1990s C-7

Figure C-7: Count of CF Commitments Initiated Since World War II C-8

Figure C-8: Count of CF Commitments Ended Since World War II C-9

Figure C-9: Net Change in CF Commitments Since World War II C-10

Figure C-10: Duration of CF Commitments Initiated Since World War II C-11

Figure C-11: Duration of CF Commitments Initiated During 1990s C-12

Figure C-12: Duration of CF Commitments Ended Since World War II C-13

1. The following ten figures are the same as those in the main text except they are expanded to landscape for easier viewing. They are presented here without further discussion.

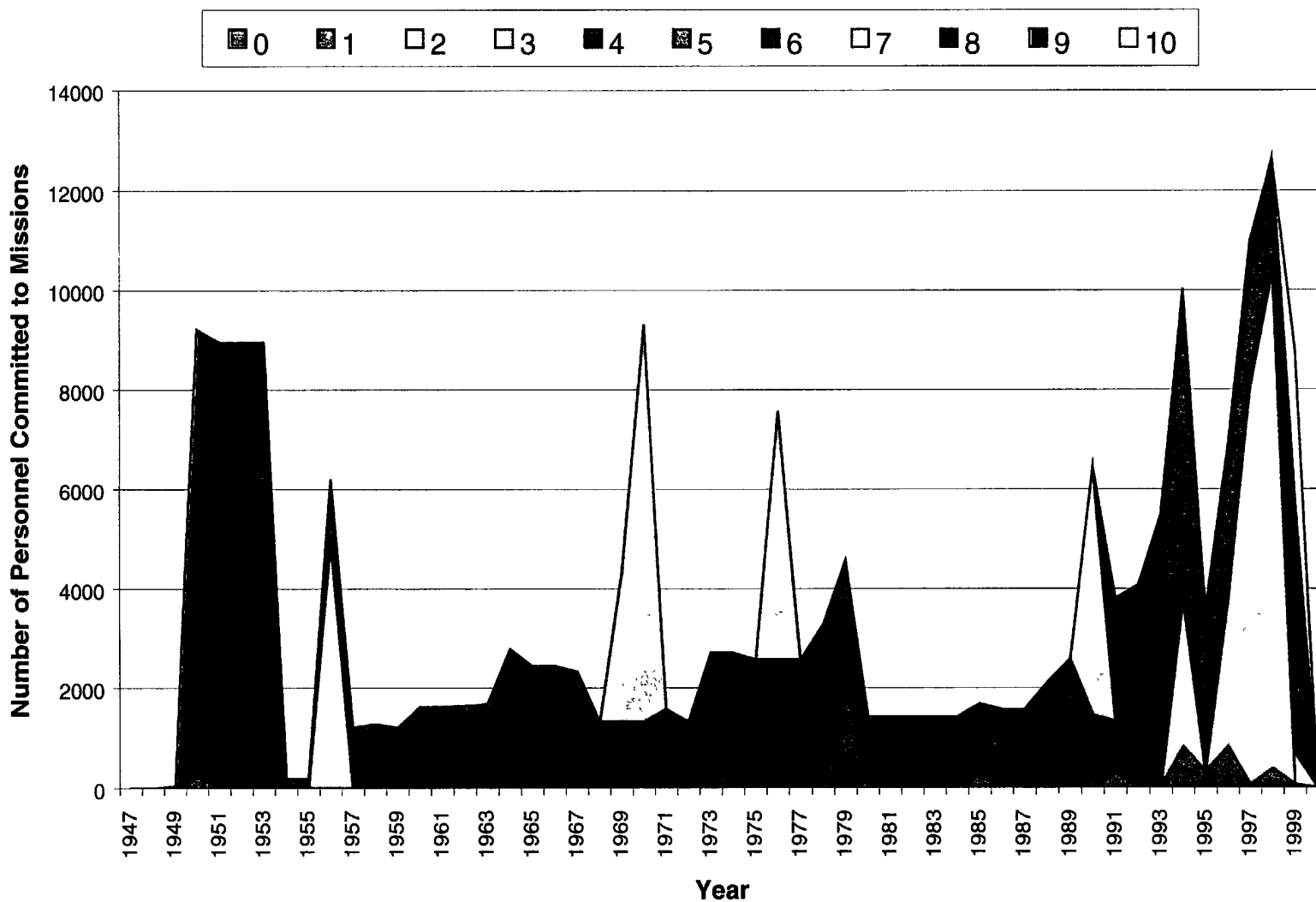


Figure C1 : CF Personnel Commitments Since World War II by Scenarios

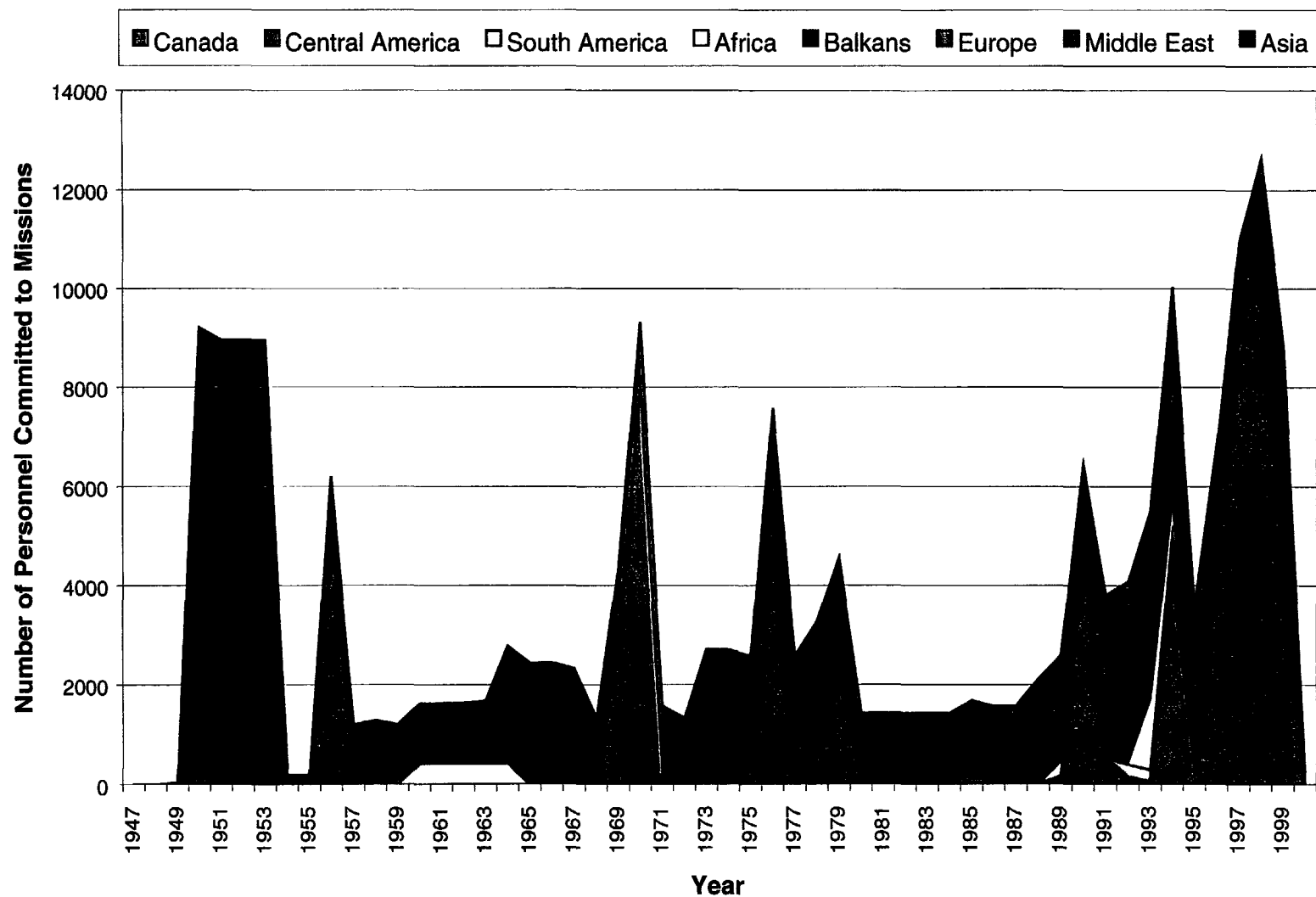


Figure C2 : CF Personnel Commitments Since World War II by Regions

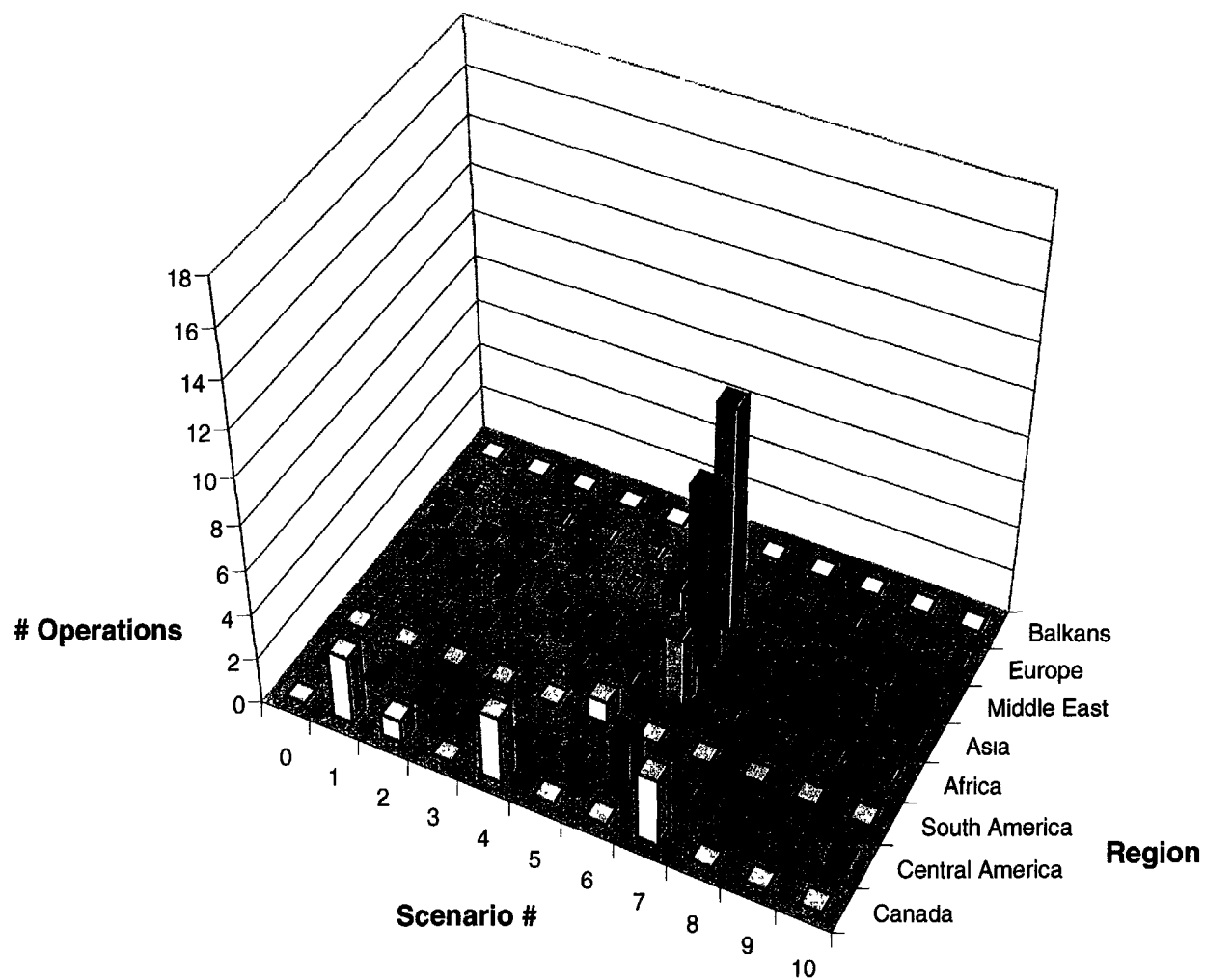


Figure C3 : CF Commitment Before 1990 Distributed by Scenario and Region

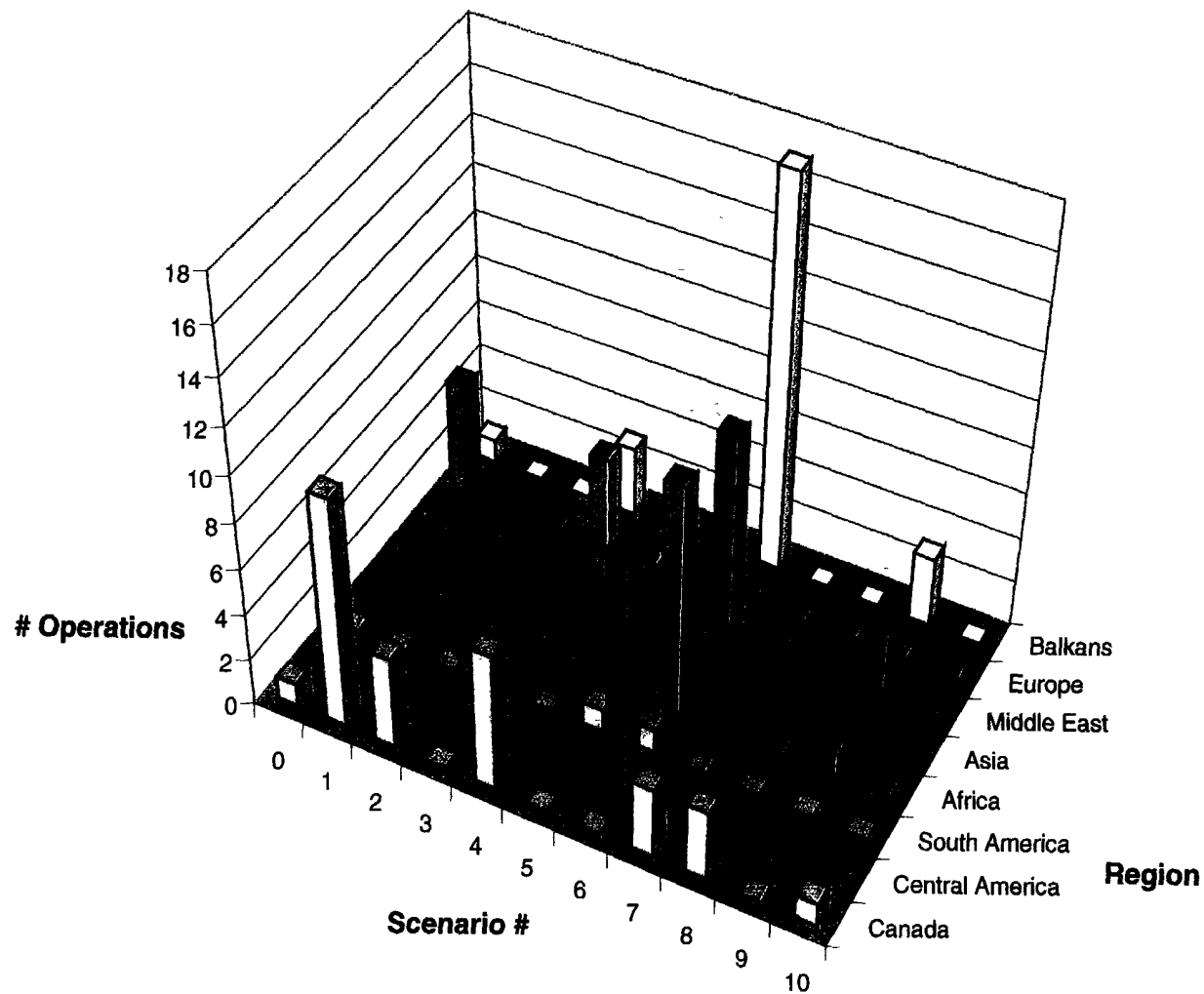


Figure C4 : CF Commitment During 1990s Distributed by Scenario and Region

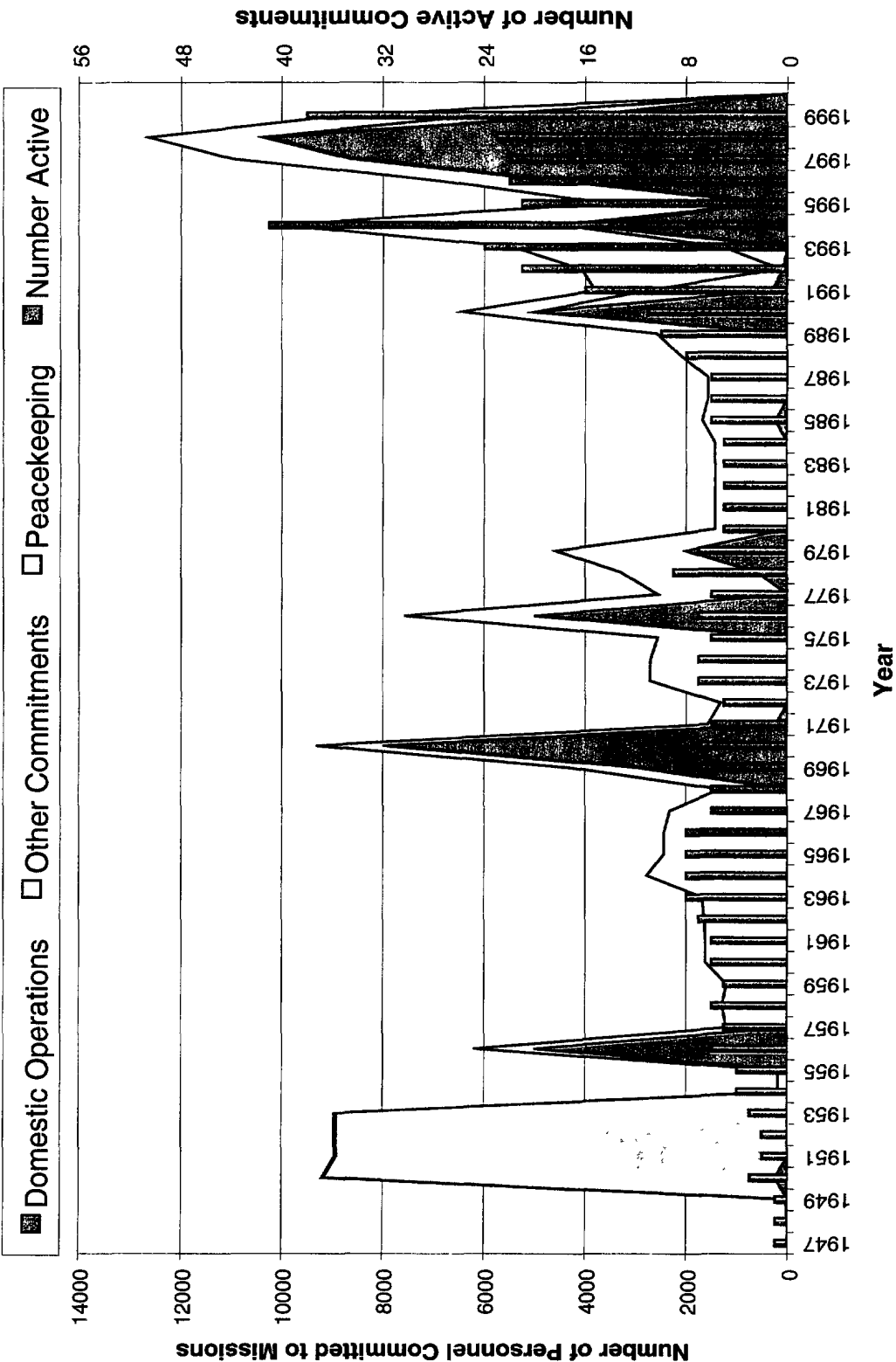


Figure C5 : Aggregated CF Personnel Commitments Since World War II

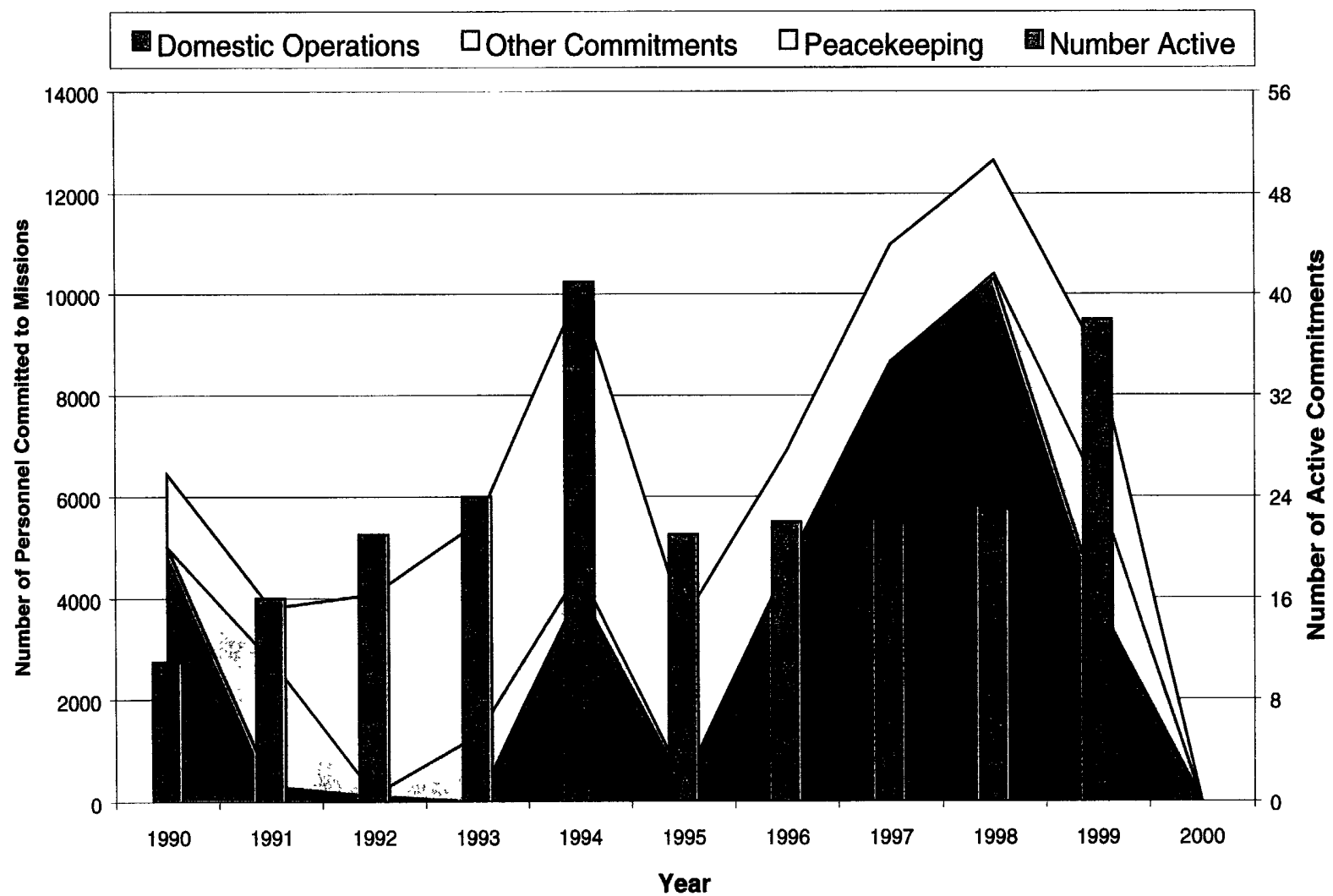


Figure C6 : Aggregated CF Personnel Commitments During 1990s

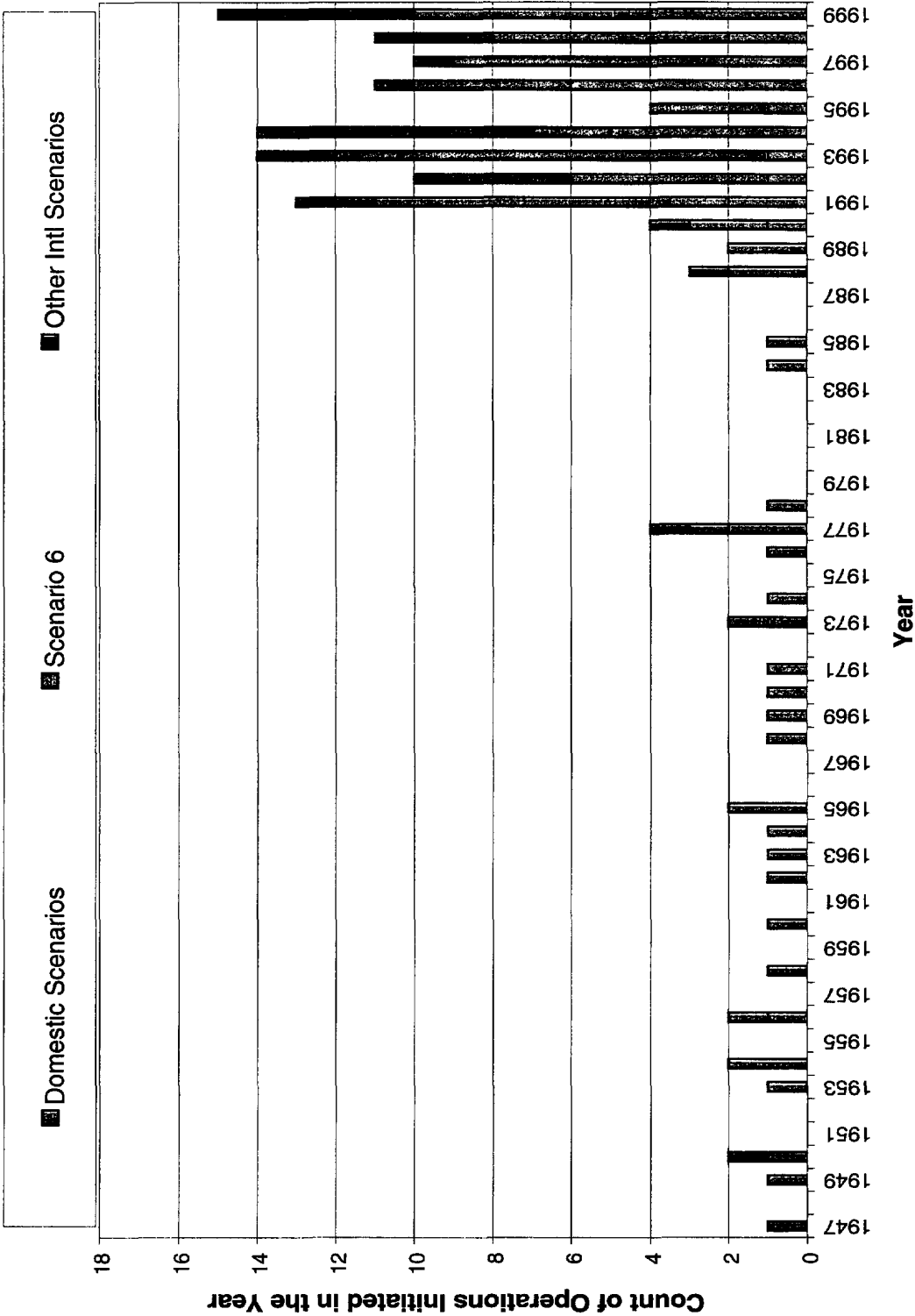


Figure C7: Count of CF Commitments Initiated Since World War II

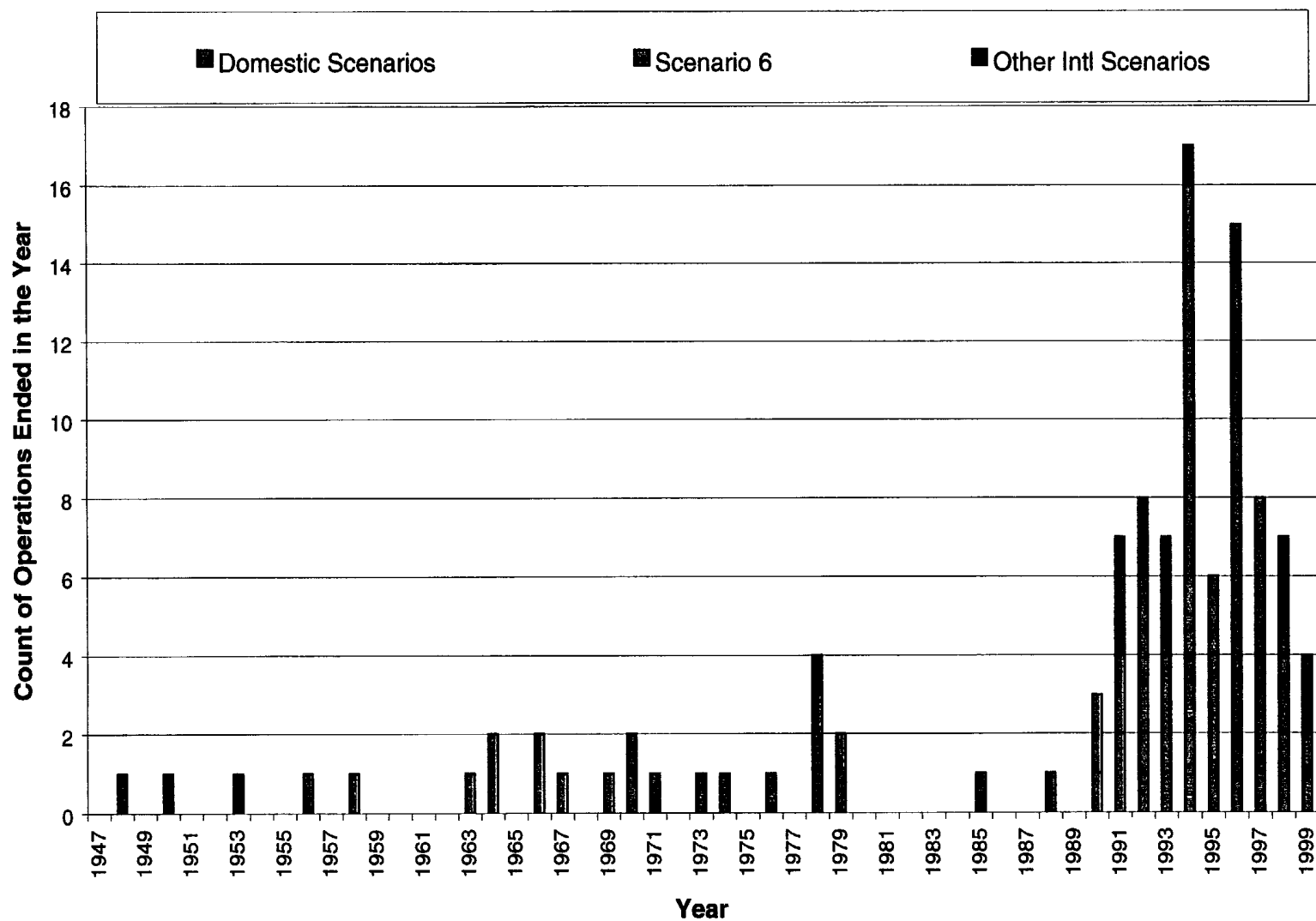


Figure C8: Count of CF Commitments Ended Since World War II

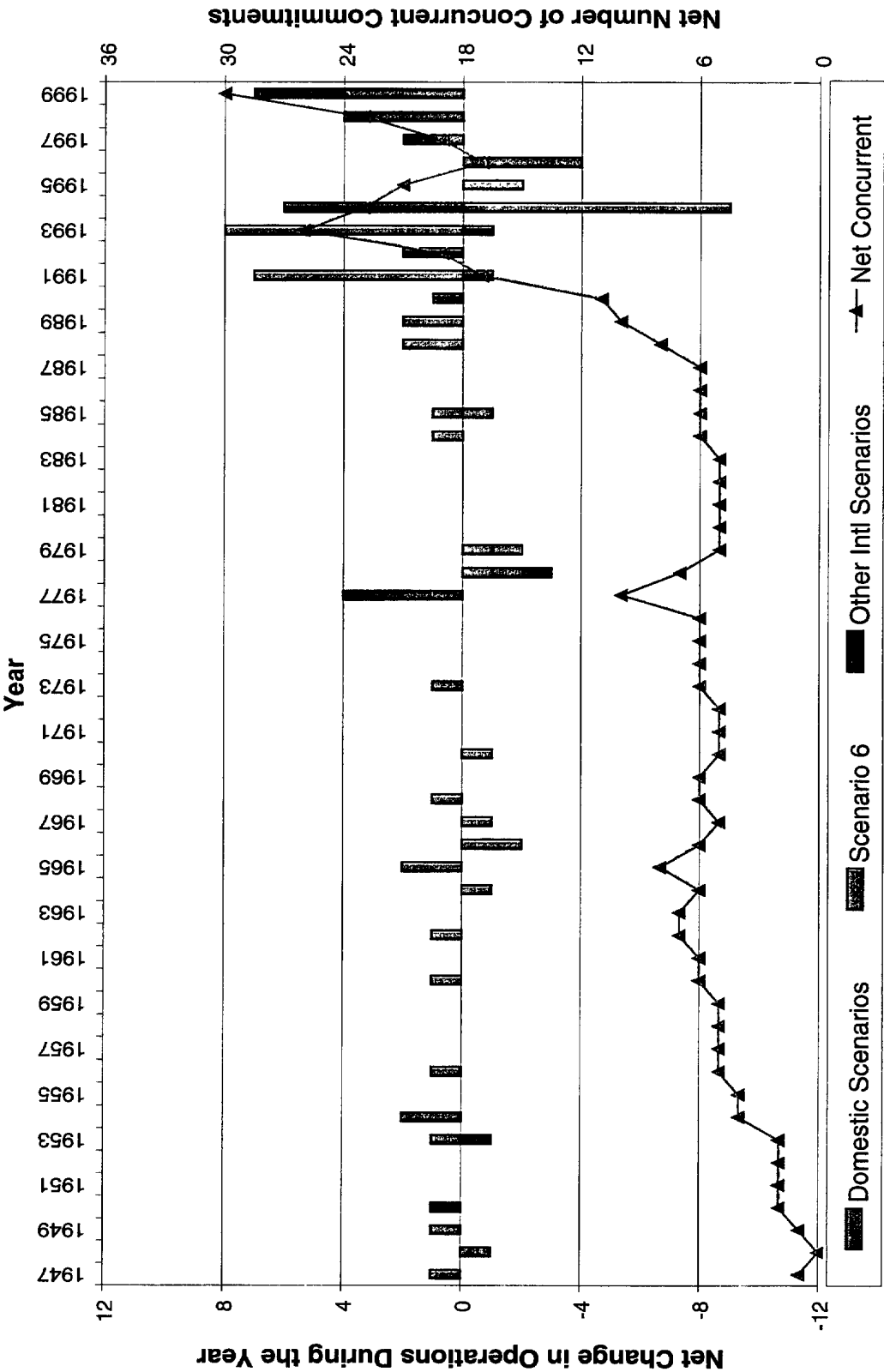


Figure C9: Net Change in CF Commitments Since World War II

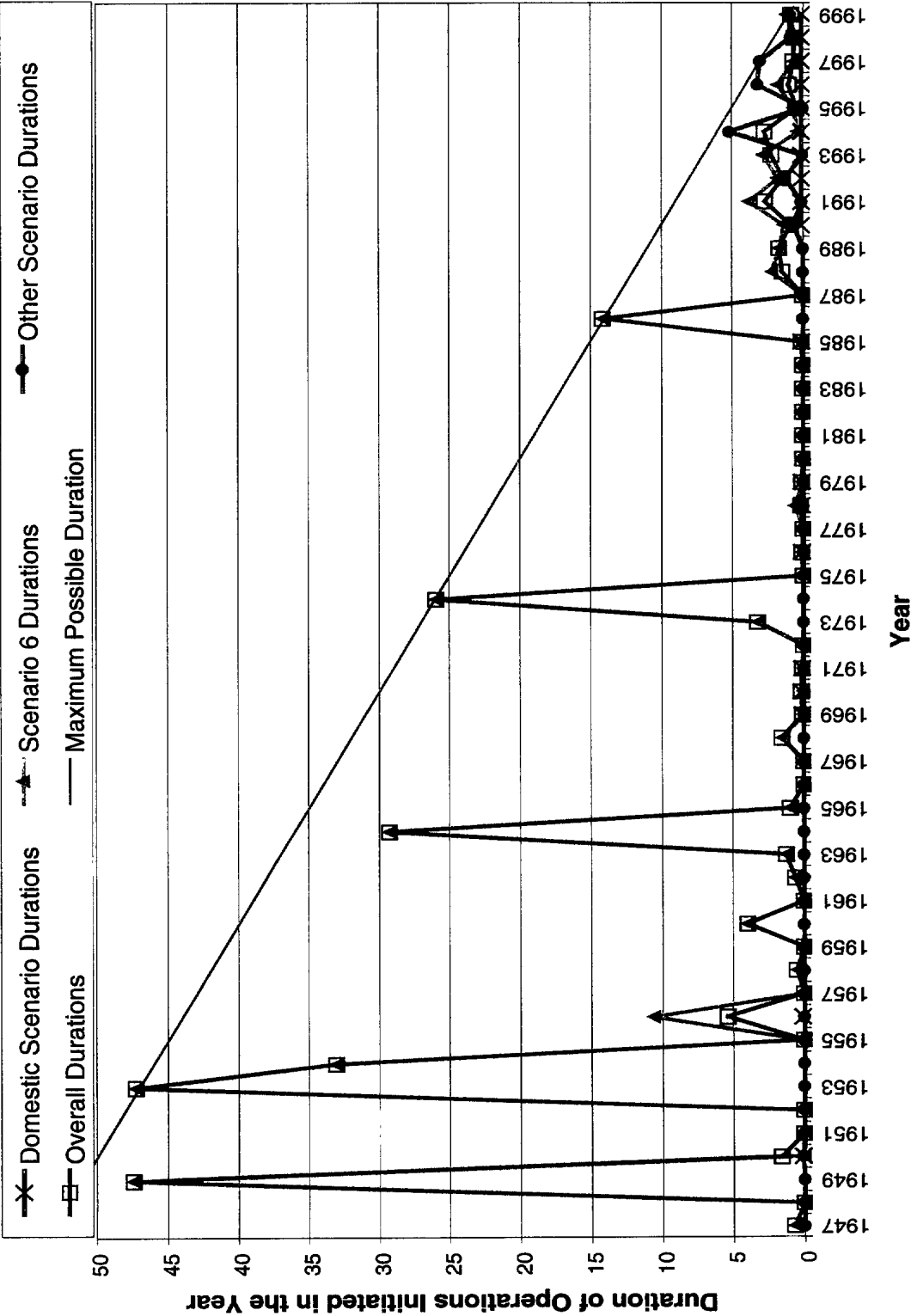


Figure C10: Duration of CF Commitments Initiated Since World War II

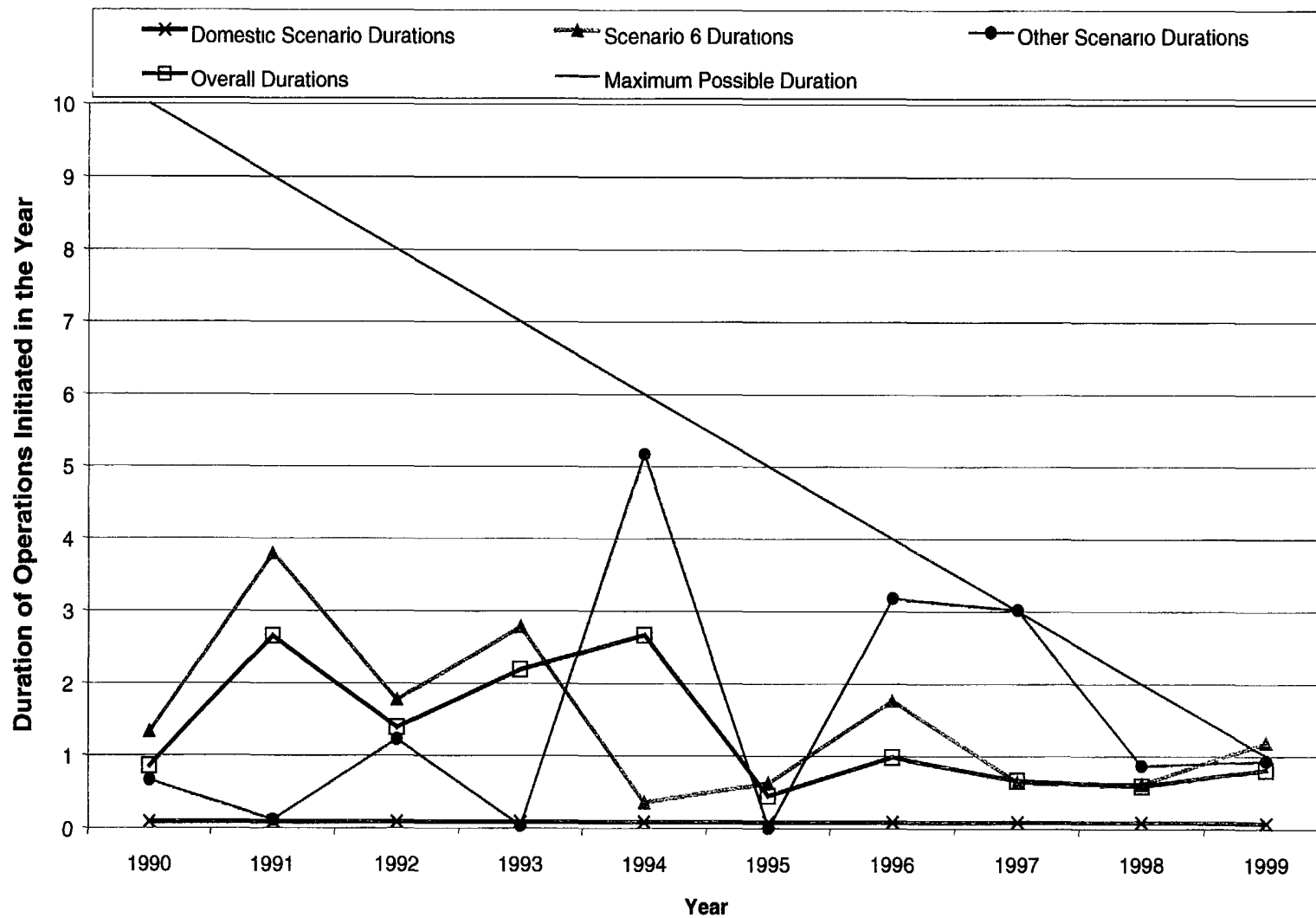


Figure C11: Duration of CF Commitments Initiated During 1990s

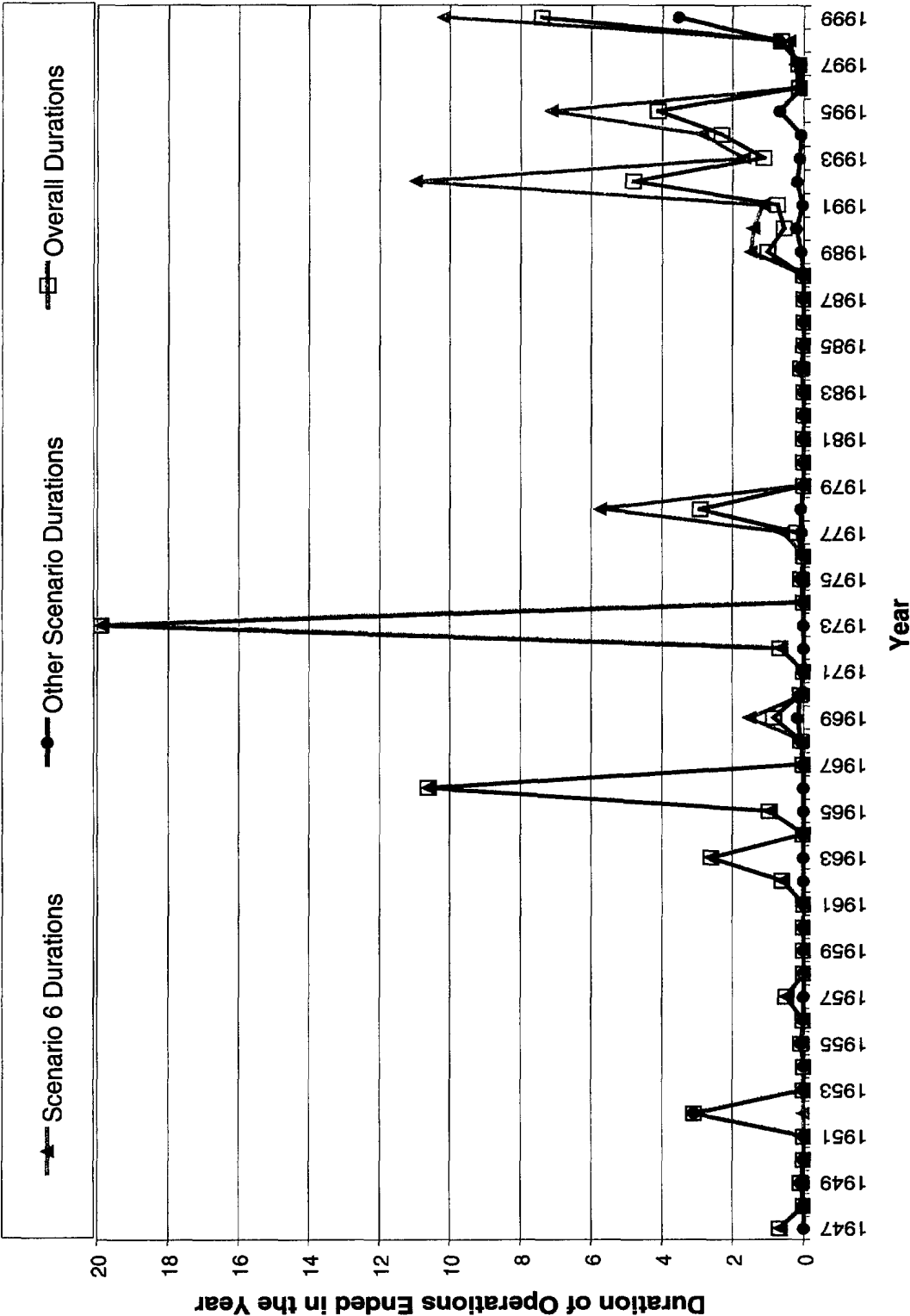


Figure C12: Duration of CF Commitments Ended Since World War II

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APPENDIX I
ANNEX C
DOR(J&L) RESEARCH NOTE RN 2000/24
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ADDITIONAL FIGURES USED TO HELP ASSESS CF COMMITMENTS

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Figure CI- 1: 1990s Commitments Grouped by Scenarios..... CI-2
Figure CI- 2: 1990s Commitments Grouped by Operational Area..... CI-2
Figure CI- 3: 1990s Domestic Commitments Grouped by Scenarios CI-3
Figure CI- 4: 1990s International Commitments Grouped by Scenarios CI-3
Figure CI- 5: 1990s International Commitments Grouped by Operational Area CI-4
Figure CI- 6: 1990s Commitments Grouped by Start Dates..... CI-4
Figure CI- 7: 1990s Commitments Grouped by End Dates..... CI-5
Figure CI- 8: Commitments Grouped by Sustainment Issues CI-5

1. The following eight figures were used to supplement the analysis of the figures in Annex C. They are presented here as a group without further discussion.

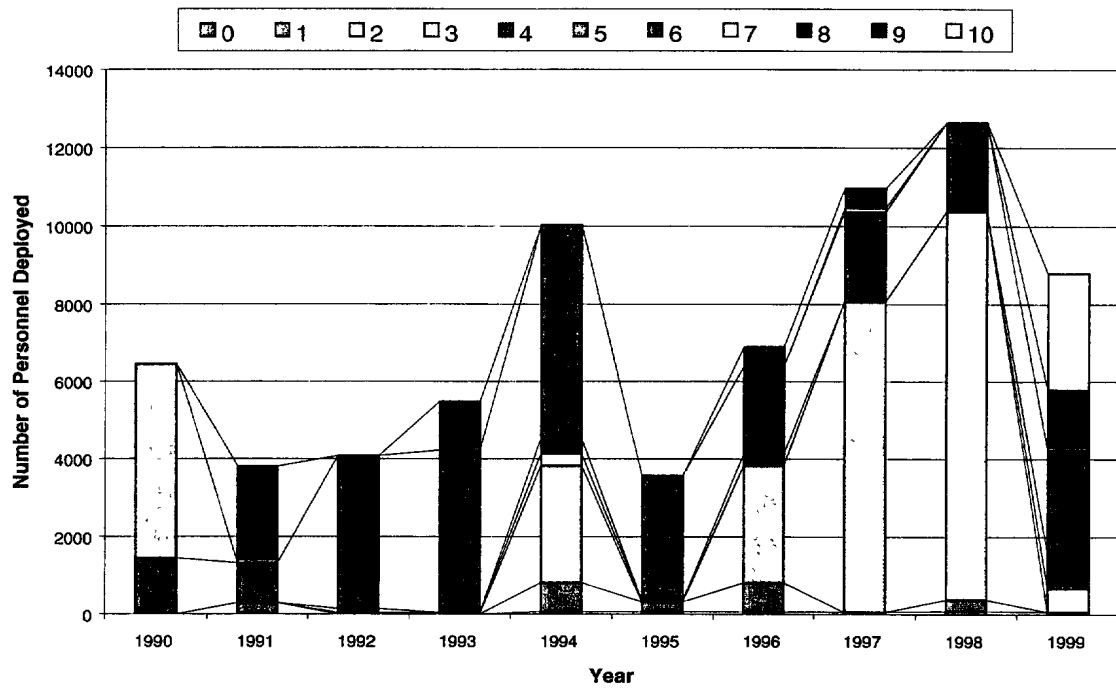


Figure CI- 1 : 1990s Commitments Grouped by Scenarios

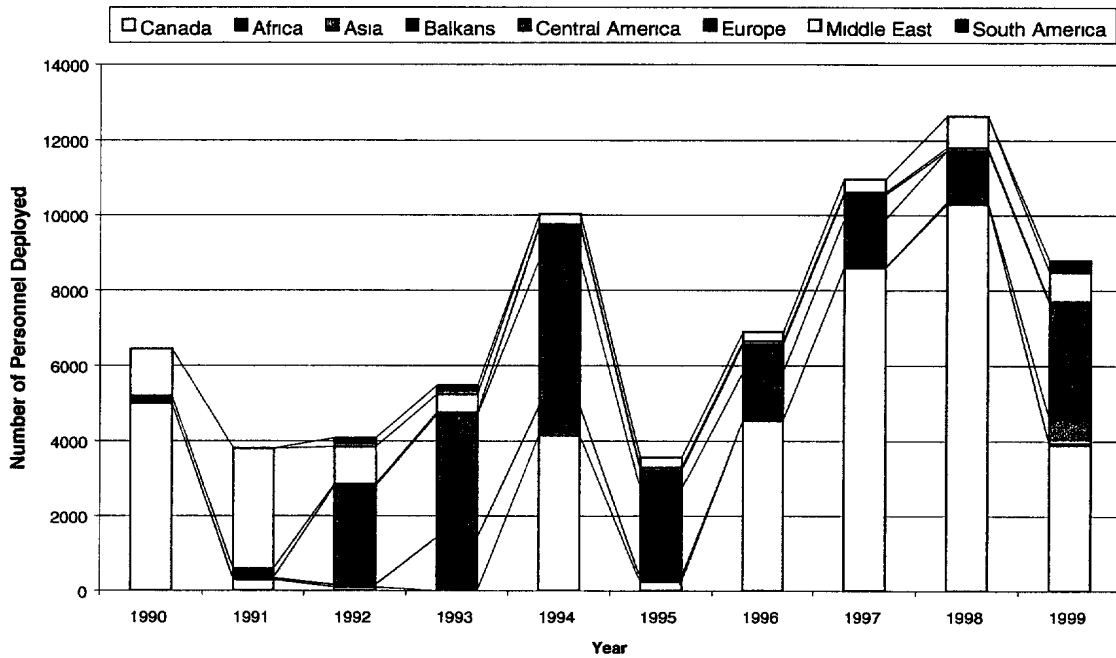


Figure CI- 2 : 1990s Commitments Grouped by Operational Area

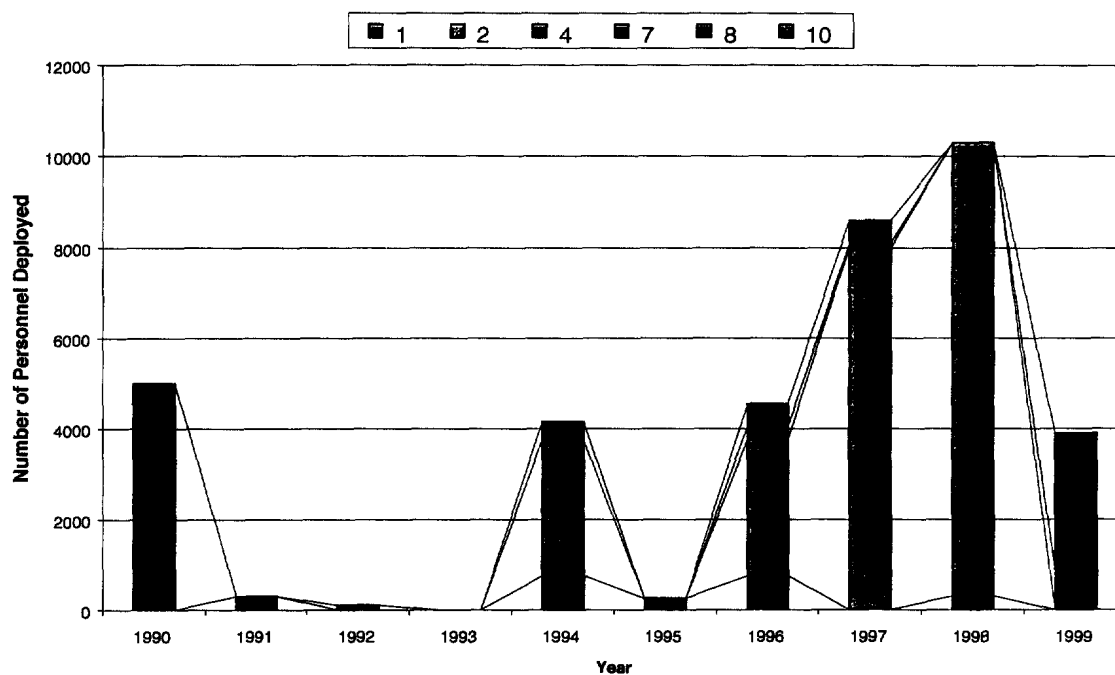


Figure CI- 3 : 1990s Domestic Commitments Grouped by Scenarios

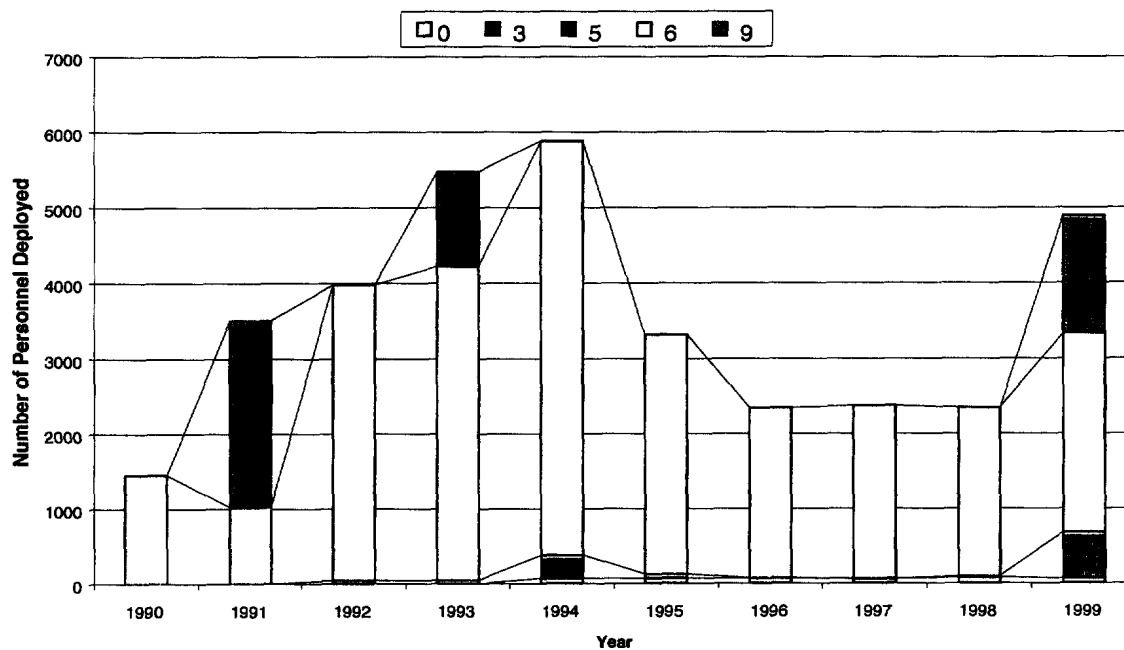


Figure CI- 4 : 1990s International Commitments Grouped by Scenarios

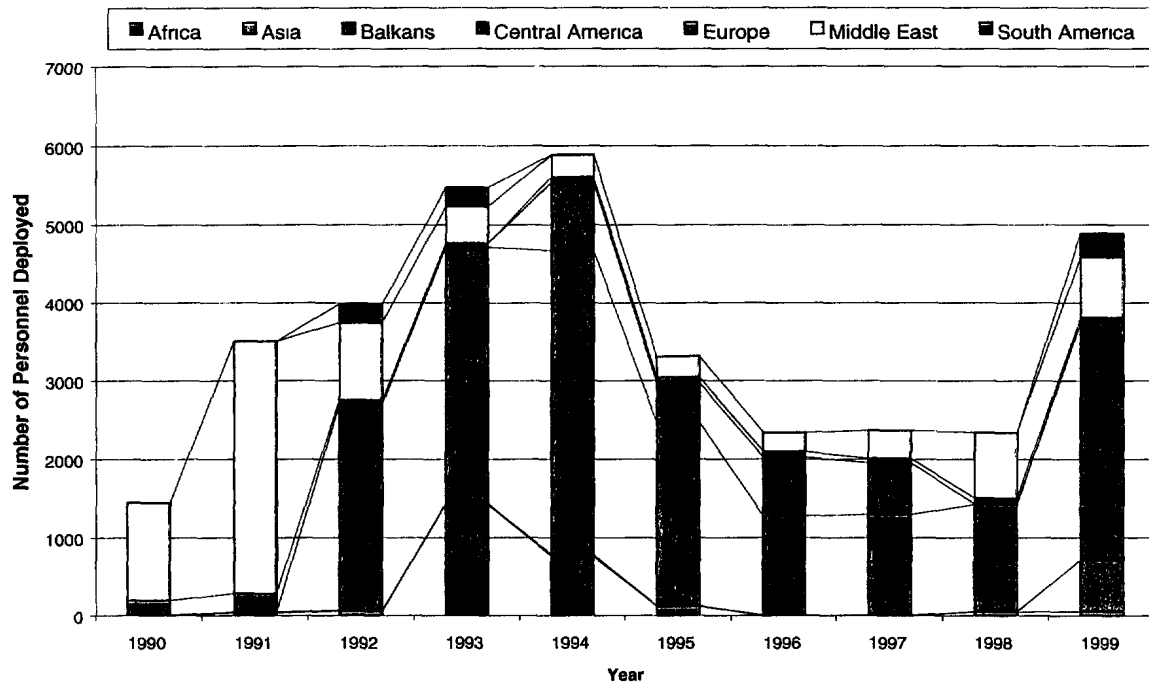


Figure CI- 5 : 1990s International Commitments Grouped by Operational Area

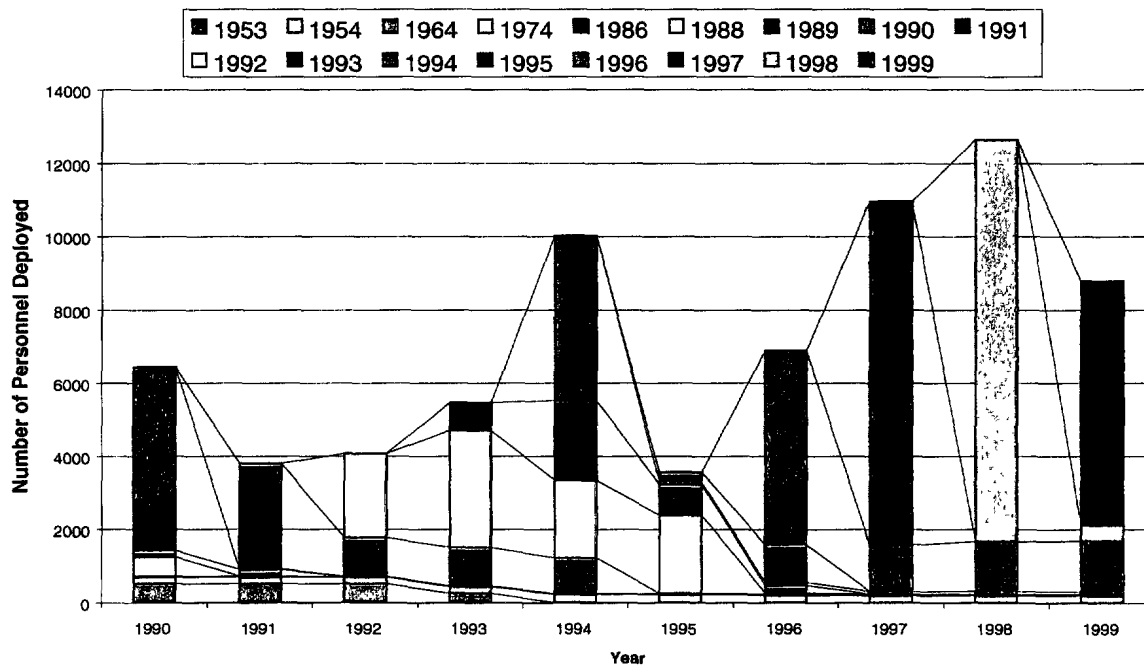


Figure CI- 6 : 1990s Commitments Grouped by Start Dates

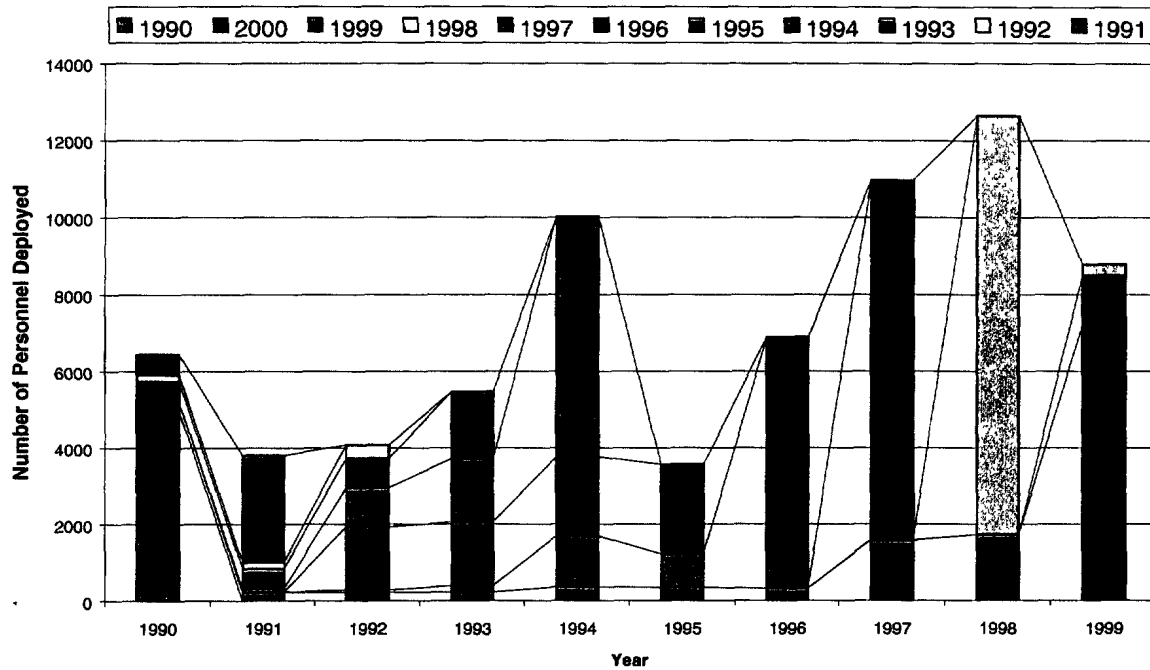


Figure CI- 7 : 1990s Commitments Grouped by End Dates

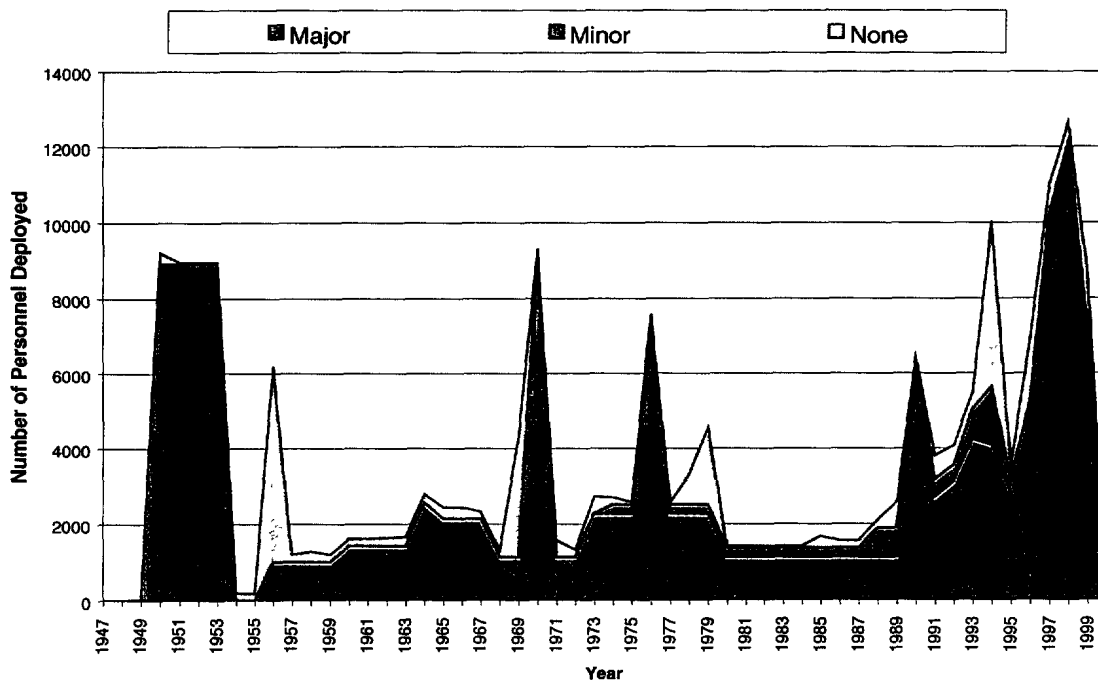


Figure CI- 8 : Commitments Grouped by Sustainment Issues

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4. AUTHORS (last name, first name, middle initial) Funk, Ronald W.		
5. DATE OF PUBLICATION (month Year of Publication of document) December 2000	6a. NO OF PAGES (total containing information. Include Annexes, Appendices, etc.) 68	6b. NO OF REFS (total cited in document) 12
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This analysis set out to gain a better understanding about the quantifiable characteristics of CF commitments. The initial goal was to identify the main themes and then expand the effort along interesting lines of analysis when it appeared useful. The report explains how the available information on CF commitments was compiled into a comprehensive spreadsheet for subsequent analysis. The first component of the analysis focussed on visualising the data along timelines and in stacked figures. The key themes identified were then quantified using basic statistics in a series of tables. The results provide a useful set of activation rates needed by Scenario Operational Capability Risk Assessment Model (SOCRAM) and other strategic capability planning efforts.

14. **KEYWORDS, DESCRIPTORS or IDENTIFIERS** (technically meaningful terms or short phrases that characterize a document and could be helpful in cataloguing the document. They should be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location may also be included. If possible keywords should be selected from a published thesaurus, e.g. Thesaurus of Engineering and Scientific Terms (TEST) and that thesaurus-identified. If it is not possible to select indexing terms which are Unclassified, the classification of each should be indicated as with the title.)

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SCENARIO OPERATIONAL CAPABILITY RISK ASSESSMENT MODEL (SOCRAM)

ACTIVATION RATE

CAPABILITY PLANNING

CANADIAN FORCES COMMITMENTS

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